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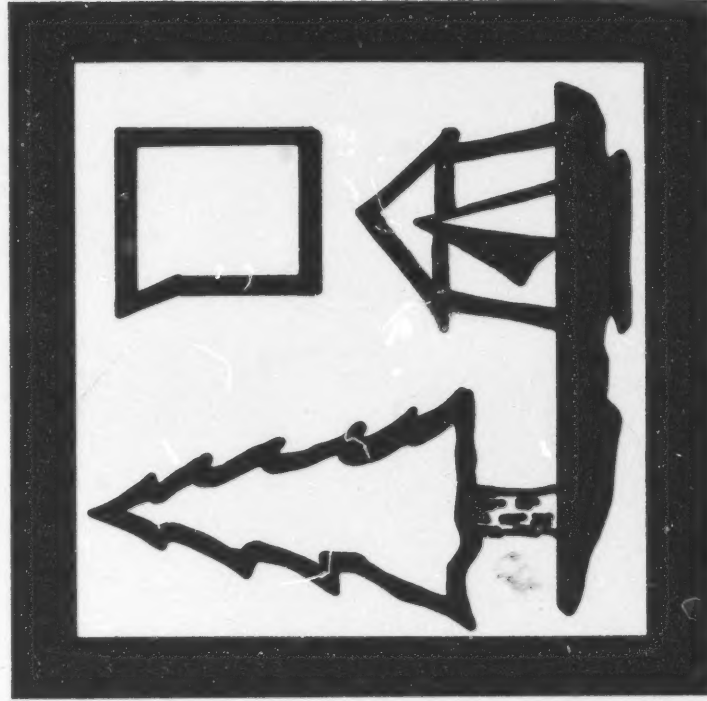
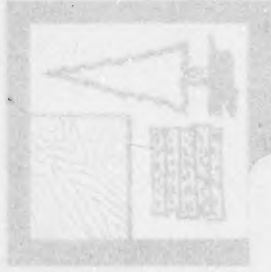
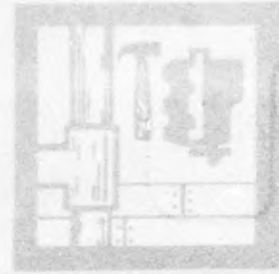
ABSTRACT

The guide was developed for teachers of a one-year high school course in environmental and natural resources occupations and was part of larger project to revise the total agricultural education curriculum in South Carolina. A curriculum paradigm is presented with units and subunits diagramed and time periods suggested for each. Basic supportive units are orientation, ecology, weather, land use, and population and our environment. The four functional units (each with two to six subunits) are: conserving and utilizing the essentials of our environment, maintaining or improving environmental health, maintaining or improving the beauty of our environment, and maintaining or improving outdoor recreation. Career exploration subunits are presented for each of the functional units. Each subunit includes behaviorally stated objectives, suggested learning activities, a content outline of topics, and suggested resources. Appendixes include a table of manpower needs in the field, a list of facilities and equipment needed, and a selected list of related professional and technical societies and organizations. A bibliography of bulletins, films, transparencies, and almost 50 books is provided. (SC)

ED 090389

ENVIRONMENTAL AND NATURAL RESOURCES SKILLS TRAINING OCCUPATIONS

IN AGRICULTURAL EDUCATION



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PRELIMINARY DRAFT

TEACHER'S GUIDE

Environmental and Natural Resources Occupations

A Teacher's Guide

Preliminary Draft
(For Discussion Only)

Prepared by:

State Department of Education
Office of Vocational Education
Agricultural Education Section
Columbia, South Carolina 29201

In Cooperation With:

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Clemson, South Carolina 29631

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Foreword

This curriculum guide was developed as a part of a larger project to revise the total agricultural education curriculum in South Carolina. The project was designed to implement the following changes:

- . provide a more comprehensive vocational offering
- . place a greater emphasis on behavioral objectives
- . place a greater emphasis on learning activities
- . encourage an inductive approach to teaching
- . result in re-identification of the units of instruction

Units of instruction for each course were developed which include behaviorally stated objectives, suggested learning activities, a content outline, and suggested resources.

Mr. Frank R. Stover, State Supervisor
Agricultural Education

Acknowledgements

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The final copy was edited and prepared by Dr. R.J. Mercer, Vocational Instructional Materials Specialist, Vocational Education Media Center.

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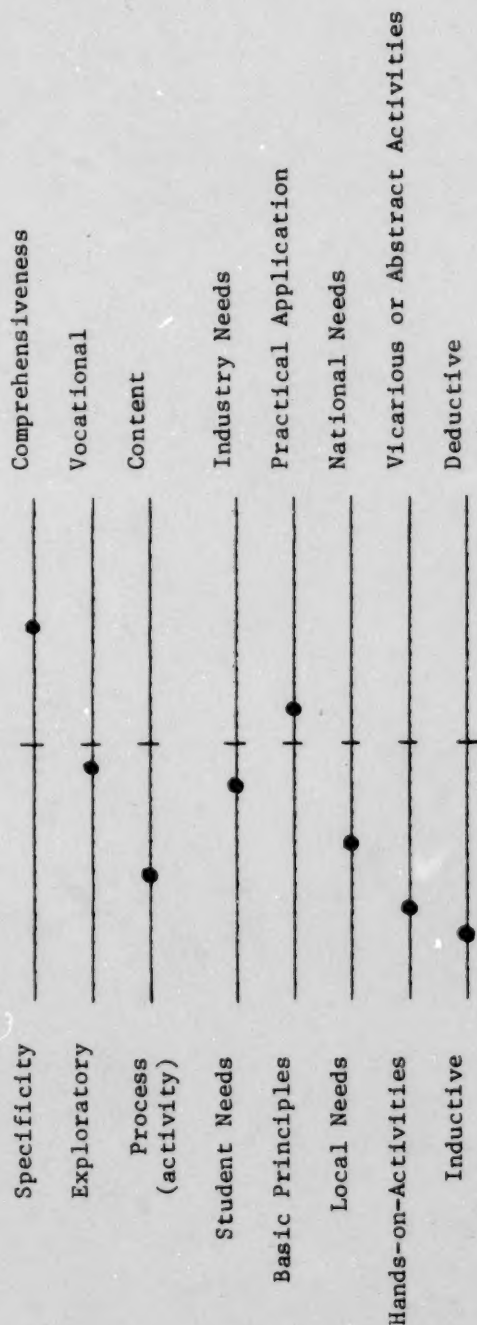
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Rationale for the Course

Increased public concern over environmental quality, increased state and federal support for programs designed to conserve and improve our environment and the need and opportunity for trained manpower in this area (see appendix A) provide ample support for offering a course in environmental and natural resources occupations in the high schools of South Carolina. This publication was developed to serve as a guide for the teachers who will teach this course.

Curriculum Framework

The designers of this course used the following continuums to frame their thinking as they constructed the course. The designers tried to consider both ends of these continuums. The biases of the committee are indicated below. For example, the committee felt that at the high school level they would prefer comprehensiveness to specificity. In other words, they felt that to be taking a course in environmental and natural resources occupations is specialization enough; to specialize even further by choosing only one area such as wildlife or recreation would represent over specialization at the high school level. Hence, as indicated by the dot on the continuum, the committee leaned toward comprehensiveness.



ENVIRONMENTAL AND NATURAL RESOURCES OCCUPATIONS

Conserving and Utilizing the Essentials of Our Environment	Protecting or Improving the Health Aspects of Our Environment	Maintaining or Improving the Beauty of Our Environment	Maintaining or Improving Outdoor Recreation
Orientation (Supervised Practice, Occupational Work Experience, Career Exploration and FFA) (1 week)			
Ecology (2 weeks)			
Weather (1 week)			
Land Use Planning (1 week)			
Environment and Population (1 week)			
Minerals (1 week)	Career Opportunities (1 week)		
Water (2 weeks)	Air Pollution (1 week)	Home Environment (1 week)	Park and Park Programs (2 weeks)
Wildlife (3 weeks)	Water Pollution (1 week)	Work Environment (1 week)	Outdoor Sports and Camping (2 weeks)
Soil (4 weeks)	Noise Pollution (1 week)	Play Environment (1 week)	
Forest (4 weeks)	Solid Waste Pollution (1 week)	Business Environment (1 week)	
	Career Opportunities (1 week)		

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Use of the Guide

This guide is not a textbook. It is, as entitled, a teacher's guide. It is not designed to provide content, but to refer to content. It is designed to ask the prior questions - what should be taught and to some degree how and with what resources. The objectives are not behavioral in the truest sense - they may be closer to goals. Hopefully they help spell out the expected outcomes of the course. It was felt that the teachers of the course can determine the "givens" of the objectives and set their own "performance standards" as needed for a particular class or individual.

The general framework of the course is problem solving. To this degree, it is a functional approach. Hopefully, most units will be taught inductively, i.e., the teacher will begin with a practical problem or project and back up to basic principles. It is also hoped that most of the learning activities will be "hands-on" type activities although the importance of vicarious learning is recognized.

This curriculum guide was designed as a one year course; however, it is felt that in some schools a two year course may be desirable. If the guide is to be used for such a course, it is recommended that each unit be expanded. The proportionate amount of time spent in each area would remain the same.

BASIC SUPPORTIVE UNITS

UNIT: Orientation to Environmental and Natural Resources Occupations

OBJECTIVE(S): The Student will be able to:

- I. Describe in outline form the course in environmental and natural resources occupations.
- II. Prepare in outline form a plan for integrating the FFA program into the course on environmental and natural resources occupations.
- III. Prepare in outline form a supervised practice program which will enrich the course in environmental and natural resources occupations.
- IV. Plan an occupational work experience program to complement the course in environmental and natural resources occupations.
- V. Prepare a plan for exploring careers in environmental and natural resources occupations.

VI.

UNIT: Orientation to Environmental Occupations
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Describe in outline form the course in environmental occupations. A. List the <u>major</u> objective(s) of each unit. B. List the <u>major</u> learning activity(s) to be accomplished in each unit. C. List the <u>major</u> topic(s) to be covered in each unit. D. List the major resources to be used in each unit. E. II. Prepare in outline form a plan for integrating the FFA program into the course in environmental occupations. A. List possible community environmental improvement activities which could become projects for FFA. B. List environmental projects suitable as part of the BOAC program. C. List some of the possible radio or TV programs that could be built around environmental activities. D. List some of the team contests that are related to environmental activities, e.g., land identification and treatment. E. List some of the individual content related to environmental activities. F.	I. Assign a committee to each of the major units and have them critique the unit and report their results to the class with suggestions for change. Observe a presentation by the instructor of the course model via overhead projection. II. Prepare a list of proposed environmental projects for FFA. Enter FFA contests related to environmental occupations. Prepare radio or TV programs concerning environmental improvement in the local community.

SUB-UNIT:

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UNIT: Orientation to Environmental Occupations

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
III. Prepare in outline form a supervised practice program which will enrich if not form the core of the course in environmental occupations. A. List at least two possible home production projects. B. List at least two possible home improvement projects related to improving the environment. C. List at least two supplementary farm jobs related to improvement of the home environment. D.	III. Conduct a home production project related to environmental productions, e.g., establishing a pine tree planting. . Perform a supplemental home or farm job related to environmental occupations, e.g., sow a wildlife feeding strip. . Perform a home improvement project related to environmental occupations, e.g., establish a ground cover planting of the home grounds.
IV. Plan an occupational work experience program to complement the course in environmental occupations. A. List at least <u> </u> work stations in your community which would provide training in occupations related to the environment. B. Prepare a brief work schedule for occupational work experience at one such station. C.	IV. Make plans for and/or obtain a part-time job in an environmental occupation which will help prepare for a future career. . Prepare a work schedule for a chosen work station.
V. Prepare a brief plan for exploring careers in environmental occupations. A. List at least <u> </u> tests which can be used to analyze personal strengths and weaknesses. B. List at least <u> </u> criteria for evaluating careers. C.	V. Ask for an interview with your guidance counselor to discuss your strengths and weaknesses. . As a class project, try to set up a list of guidelines for evaluating careers as each career area is explored during the course.
VI.	VI.

UNIT: Orientation to Environmental Occupations

SUB-UNIT:

TOPICS	RESOURCES
III. Integration of the supervised practice program in- to the environmental occupations course. A. Productive projects B. Home improvement projects C. Supplementary farm jobs D. IV. Occupational Work Experience in Environmental career areas. A. Locating work experience stations B. Job schedules C. ... V. Career Explorations A. Personal assessment . Aptitudes . Attitudes . Skills . General competencies B. Criteria for career evaluation C. ... VI. ...	III. . Miller. <u>Supervised Practice in Vocational Agriculture.</u> IV. . Binkley. <u>Experience Programs for Learning Vocations in Agriculture. Chapter 31.</u> . Fuller. <u>Education for Agricultural Occupa- tions.</u> . Hoover. <u>Handbook of Agricultural Occupa- tions.</u> V. . Hoover. <u>Handbook of Agricultural Occupations Chapter 1.</u> VI.

Reference

Orientation to Environmental and Natural Resources Occupations

BOOKS Bender, Ralph E.; Clark, Raymond and Taylor, Robert E. <u>The FFA and You</u>. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1962. Binkley, Harold and Hammonds, Corsie. <u>Experience Programs for Learning Vocations in Agriculture</u>. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1970. Byram, Harold M. <u>Guidance in Agricultural Education</u>. Canville, Illinois: The Interstate Printers and Publishers, Inc. Fuller, Gerald R. <u>Education for Agricultural Occupations</u>. Danville, Illinois: The Interstate Printer and Publishers, Inc. Hoover, Norman K. <u>Handbook of Agricultural Occupations</u>. Danville, Illinois: The Interstate Printers and Publishers, Inc., second edition, 1969. Miller, Texton R. <u>Supervised Practice in Vocational Agriculture</u>. Danville, Illinois: The Interstate Printers and Publishers, Inc.	FILMS and FILM STRIPS
BULLETINS	TRANSPARENCIES

UNIT: Ecology

OBJECTIVE(S): I. The student will be able to describe man's relationship to and dependence on the environment.

II.

UNIT: Ecology
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Describe man's relationship and dependence on the environment. A. Identify and describe in writing or through drawings a given ecosystem. 1. Given an ecosystem, define the components, i.e., the producers, their primary, secondary, and tertiary consumers. 2. Differentiate between the terms herbivore and carnivore in a given ecosystem. 3. Identify at least 2 food chains in a given ecosystem. 4. B. Identify and describe man's relationship to a given ecosystem. 1. Identify the niche of man in a given environment, i.e., Is he producer or consumer? 2. List the major components of man's ecosystem, i.e., climate, animals, plants, soil. 3. List some of the critical imbalances of man's ecosystem in the local community, e.g., the effect of the automobile. 4. Analyze a given environment in terms of imbalance. 5. Describe a balanced ecosystem for the local community. 6.	I-A. Compile a list of ecosystems in different locations and of different scope, e.g., on a large scale-the ecology of farm, on a small scale - the ecology of an aquarium. . Prepare a chart depicting an ecosystem. . Take field trips to observe local ecosystems. . Construct a mini-ecosystem using a jar of water, soil and plants (see reference by Andrews, <u>A Guide to the Study of Fresh Water Ecology</u>, pp. 15-16.) . With the aid of the science teacher, analyze the small pond ecosystem. . Prepare a live cycle poster of an animal. B. Prepare a diagram showing man and his ecosystem. . Compile a list of some of the critical imbalanced ecosystem in the local community. . Trace the effect of adding a pesticide to water. See reference ____. . Trace the effect of air pollution caused by the automobile on the ecology of the local area.

UNIT: Ecology

SUB-UNIT:

TOPICS	RESOURCES
I. Ecology A. Identification of an ecosystem 1. Components a. producers b. 1st, 2nd, and 3rd level consumers c. ... 2. Life cycles a. energy cycles b. nutrient cycles c. ... 3. Food chains 4. ... B. Man's relationship to ecosystems 1. Man's niche in the ecosystem 2. Components of man's ecosystem a. climate b. animals c. plants d. soil e. ... 3. Critical imbalances in an ecosystem a. defining the ideal ecosystem b. identifying the 1st cause of the imbalance 4. Methods of preventing or correcting imbalance 5. Setting goals for the "perfect" ecosystem 6. ...	I-A. Andrews, William A. <u>A Guide to the Study of Freshwater Ecology</u>, pp. 6-16. • Ehrlich. <u>Population Resources, Environment</u>, pp. 157-191. • Films. Catalog 1972-74 from the Audio-Visual Department, Division of Educational Services, University of South Carolina, Columbia, S. C. Lists over 200 films on environmental science. • Film. <u>We Need Each Other</u>. A group of four 50-minute/16 mm films. Covers topical ecology problems. Student and teacher aid materials. Xerox Corporation. Cost - unknown. B. Andrews, William A. <u>A Guide to the Study of Freshwater Ecology</u>, pp. 6-16. • Ehrlich. <u>Population Resources, Environment</u>, pp. 157-191. • Kit. "Ecology and Agriculture." Multimedia kit including five full color filmstrips, tapes, transparencies. Cost - unknown. • Game. "Ecology--The Game of Man and Nature." \$10.00.

UNIT: Ecology

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
C. Given an imbalance ecosystem in the local community which is very important to the people, make recommendations for correcting the imbalance. D. Analyze water to determine its ability to support plant and animal life using at least six of the more commonly used measures. 1. Given the necessary equipment, the student will be able to measure the dissolved oxygen content of a given water supply. 2. Given the necessary equipment, the student will be able to determine the pH of a given water supply. 3. Given the necessary equipment, the student will be able to measure and record the temperature of a supply of water. 4. Given the necessary equipment, the student will be able to measure and record the total suspended solids in a given supply of water. 5. Given the necessary equipment, the student will be able to measure and record the transparency of a given supply of water. 6. Given the necessary equipment, the student will be able to free carbon dioxide in a given supply of water. 7.	C. As a class project, analyze an ecosystem and try to locate the imbalances and recommend changes, e.g., the lack of proper pH level and its effect on nutrients, soil organisms, plant growth, etc.--or the effect on improper water temperature or pH on plant life in a pond and the subsequent effect on fish - on animals - etc. D. Observe demonstrations of and/or conduct a dissolved oxygen test of water. . Observe demonstrations of and/or conduct a pH test of water. . Observe demonstrations of and/or conduct a test of the total suspended solids in a given supply of water. . Observe demonstrations of and/or conduct a test to determine the transparency of water. . Observe demonstrations of and/or conduct a test to determine the carbon dioxide content of water.

UNIT: Ecology

SUB-UNIT:

TOPICS	RESOURCES
C: Recommendations for changing an ecosystem. D. Fresh water analysis 1. dissolved oxygen test 2. pH test 3. temperature 4. total suspended solids test 5. transparency test 6. carbon dioxide test 7. ...	C. Ehrlich. <u>Population Resources, Environment</u>, pp. 157-191. Andrews, William A. <u>A Guide to the Study of Freshwater Ecology</u>, pp. 2-16. D. Andrews, William A. <u>A Guide to the Study of Freshwater Ecology</u>, pp. 89-108. ...

UNIT: Ecology

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
E. Analyze a small ecosystem of a pond in terms of its small animal and plant life. 1. Collect samples of animal and plant life in the small ecosystem. a. Use a sieve bag b. Use a sorting screen c. Use a sorting tray d. Use an elman dredge e. 2. With the aid of appropriate references and resource persons, identify the more common animal life in a sample of water. 3. With the aid of appropriate references and resource persons, identify at least one form of microscopic animal life found in water. 4. II.	E. Observe demonstrations of and/or collect samples of small animal and plant life from a small pond. . Using references or resource persons, identify some of the small plant and animal life found in water samples. . Observe a demonstration of and/or use the microscope to observe and identify microscopic animal and plant life in a sample of water taken from a pond. II.

UNIT: Ecology

SUB-UNIT:

TOPICS	RESOURCES
E. Analysis of a freshwater ecosystem 1. Collection of samples a. sieve bag b. sorting screen c. sorting trays d. elman dredge e. 2. Identification of specimens collected 3. Identification of microscopic specimens collected II.	E. Andrews, William A. <u>A Guide to the Study of Freshwater Ecology</u>, pp. 134-149. II.

Reference

Ecology

BOOKS Andrews, William A. <u>A Guide to the Study of Freshwater Ecology</u>. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1972. Ehrlich, Paul R. and Ehrlich, Annett. <u>Population/ Resources/Environment</u>. San Francisco: W.H. Freeman and Company, 1970.	FILMS and FILM STRIPS Audio-Visual Department, Division of Educational Services, University of South Carolina, Columbia, S.C. (See catalog 1972-74 - over 200 films listed under Environmental Science). Xerox Corporation. <u>We Need Each Other</u>. A group of four 50 min./16 mm films. Price <u>unknown</u>.
BULLETINS	TRANSPARENCIES Vocation Education Productions, California State Polytechnic College, San Obsipo, California. 93401: Kit. "Ecology and Agriculture." Five color filmstrips, tapes, transparency masters, resource manual and supplemental booklets. Price - unknown. Urban Systems Incorporated, 1033 Massachusetts Avenue, Cambridge, Massachusetts. Game - "Ecology The Game of Man and Nature." \$10.00.

UNIT: Weather

- OBJECTIVE(S):
- I. The student will be able to prepare an elementary weather forecast.
 - II.

UNIT: Weather

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Prepare and/or interpret weather forecast. A. Describe in writing and/or through demonstrations the formation of weather. 1. Given the equipment needed, demonstrate Ferrel's Law. 2. List the four great weather makers. 3. Describe in writing and/or demonstrate the effect of heat on air. 4. B. Diagram and/or describe in writing the major wind formations. 1. Diagram and/or describe the Doldrums formation. 2. Diagram and/or describe the Tradewinds formation. 3. C. Identify the nine major cloud formations. 1. Given the necessary equipment, construct a laboratory model cloud chamber. 2.	A. Observe and/or perform demonstrations of Ferrel's law using laboratory equipment. (see reference) . Observe and/or perform laboratory demonstrations which simulate the effect of the sun on moist air. (see reference) . Observe demonstrations of the earth's rotation on the creation of wind. (see reference) B. Diagram on a map or globe the location of the major wind formations. C. Observe a demonstration of and/or construct a cloud chamber. . Participate in a cloud identification contest.

UNIT: Weather
SUB-UNIT:

TOPICS	RESOURCES
I-A. Weather formation 1. Weather makers . air . heat . moisture . earth 2. Wind formation 3. Cloud formation 4. Ferrel's Law 5. B. Wind formations 1. Doldrums 2. Tradewinds 3. C. Cloud formations . cumulus . strato-cumulus . stratus . nimbo-stratus . cirrus . alto-stratus . cirro-cumulus . alto-cumulus . cumulo-nimbus	I-A. Local weathermen. . Local science teacher. . Henson. <u>Your Environment</u>, Chapter 10. B. Henson. <u>Your Environment</u>, Chapter 11. C. Local weathermen. . Local science teacher. . Henson. <u>Your Environment</u>, Chapter 12.

UNIT: Weather

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
D. Diagram and/or describe in writing the formation of thunderstorms. 1. Given the necessary equipment, simulate the formation of lightning. 2. E. Describe and/or demonstrate the formation of seven types of precipitation. 1. Given the necessary equipment, demonstrate the formation of dew. 2.	D. Observe a demonstration of and/or perform a simulation of the formation of lightning using laboratory equipment. E. Observe demonstrations of and/or perform demonstrations of the formation of different types of precipitation.
F. Diagram and/or describe in writing the formation of tornadoes, hurricanes and cyclones. G. Use at least 6 types of basic weather forecasting equipment to obtain weather data. 1. List at least 6 basic types of equipment used by weathermen. 2. Given a basic type of equipment take a reading. 3.	F. Diagram the formation of tornadoes, hurricanes, and cyclones. G. Visit a weather station and observe the types of equipment used to gather data. . Observe demonstrations of and/or construct data gathering equipment. This could be done as small group assignments.

UNIT: Weather
SUB-UNIT:

TOPICS	RESOURCES
D. Thunderstorms . Formation . Lightning E. Precipitation . Rain . Sleet . Hail . Snow . Dew . Frost F. Storms . Tornadoes . Hurricanes . Cyclones G. Forecasting equipment . Barometer . Rain gauge . Anemometer . Weather vane . Radiosonde . Sling psychrometer 	D. Henson. <u>Your Environment</u>, Chapter 13. E. Local weathermen. . Local science teacher. . Henson. <u>Your Environment</u>, Chapter 14. F. Henson. <u>Your Environment</u>, Chapters 15 & 16. G. Local weathermen. . Local science or physics teacher. . Henson. <u>Your Environment</u>, Chapter 17.

UNIT: Weather

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
H. Given the basic information and map needed prepare a weather forecast map. 1. Identify the major symbols used. 2. Locate weather highs and fronts on a map. 3. I. List the major consumers of weather forecast.	H. Visit a local weather forecaster and have him describe the location of fronts, etc., on a weather map. . Try to prepare a map for a set of hypothetical readings - check your map with a local weatherman. . Practice reading weather maps. . Participate in a symbols identification contest. I.

UNIT: Weather
SUB-UNIT:

TOPICS	RESOURCES
H. Forecast map preparation 1. Data interpretation 2. Symbol identification 3. I. Weather forecast consumers 1. Farmers 2. Pilots 3. Sailors 4. Sportsmen 5.	H. Local weathermen. . Henson. <u>Your Environment</u>, Chapter 18. I. Local farmer. . Local pilot. . Henson. <u>Your Environment</u>, Chapter 22.

References
Weather

BOOKS Henson, Collins M. <u>Your Environment: Air, Air Pollution and Weather.</u> Danville, Illinois: The Interstate Printers and Publishers, Inc., 1971.	FILMS and FILM STRIPS
BULLETINS	TRANSPARENCIES

UNIT: Land Use Planning

OBJECTIVE(S): I. Prepare an elementary plan for land use in a given community.

II.

UNIT: Land Use
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Prepare an elementary plan for land use for a given community. A. List the major criteria for evaluating a planned community. 1. List the major criteria for evaluating land use as it relates to housing. a. List the major criteria for evaluating land use as it relates to housing. b. List the major criteria for evaluating land use as it relates to the recreational, cultural, and esthetic aspects of the planned community. c. List the major criteria for evaluating land use as it relates to the utilities of a planned community. d. 2. List the major criteria for evaluating the business aspects of the planned community. 3. B. Identify and list the major uses and abuses of land and other major resources in a given community. 1. Using a map of the community, identify the major areas, i.e., business, industrial, recreational, residential, etc.	I. Interview the city manager, mayor, or members of the planning council. Have this person discuss the present and projected plans for improving the community. . Prepare a survey form to obtain requirements of industry, business, residential planners, etc. . Obtain information about some of the newer planned communities such as Columbia. B. Obtain a map of the local area and label the major areas - business, industrial, etc. . Obtain a soil topographical map of the local town or community to determine the suitability of land for various uses. . Obtain mineral and water maps of the local area and locate major mineral and water resources.

UNIT: Land Use

SUB-UNIT:

TOPICS	RESOURCES
I. Land Use	
A. Criteria for determining land use.	
1. Land for residential development	I. USDA. <u>A Place to Live, The Yearbook of Agriculture, 1963, pp. 1-78.</u>
2. Land for recreational development	. Munzer. <u>Planning Our Town.</u>
3. Land for business development	. Soil Conservation Society of America. <u>Planning and Zoning for Better Resource Use.</u>
4. Land for industrial development	. Film - <u>Cities of the Future.</u> 25 min., Rent \$18.00.
5. Land for utilities, road, sewage lines, power lines, etc.	. Film - <u>Cities Have No Limits.</u> 53 min., Rent \$24.40.
6.	
B. Uses and abuses of land in a community.	B. USDA. <u>A Place to Live, The Yearbook of Agriculture, 1963, pp. 222-228, pp. 185-189, pp. 299-358.</u>
	. Munzer. <u>Planning Our Town.</u>
	. Soil Conservation Society of America. <u>Planning and Zoning for Better Resource Use.</u>
	

UNIT: Land Use

8:3 UNIT:

OBJECTIVES	LEARNING ACTIVITIES
2. Using a set of criteria developed earlier for evaluating a planned community, identify the problems or abuses of resources in each of these areas. 3. C. Plan a zoning program for a given urban and suburban area. 1. List the major criteria to be used in zoning. 2. D. Prepare an elementary land use plan for a given area. 1. Identify the major criteria determining land use. 2. Select land areas best suited for agriculture, industry, business, residence, recreation, forestry, wildlife, etc. 3. II.	. Interview a member of the planning or zoning committee of the local town to determine the major zoning laws and their purposes. . Conduct a classroom debate of some zoning laws. D. As a class exercise plan a model community or portion of a community. . Obtain layout plans of such planned cities as Columbia. II.

UNIT: Land Use

SUB-UNIT:

TOPICS	RESOURCES
C. Zoning	C. USDA. <u>A Place to Live, The Yearbook of Agriculture, 1963, pp. 377-383.</u>
1. Reasons for zoning	. Munzer. <u>Planning Our Town.</u>
2. Types of zoning	. Film - <u>The Green City.</u> 23 min. Service charge \$5.00
a. business	.
b. industrial	
c. residential	
d.	
D. Land use plan	D. USDA. <u>A Place to Live, The Yearbook of Agriculture, 1963, pp. 367-479.</u>
1. Gathering status data	. USDA. <u>Land, The Yearbook of Agriculture, 1958, pp. 524-584.</u>
2. Predicting future needs	. Soil Conservation Society of America. <u>Planning and Zoning for Better Resource Use.</u>
3. Implementing the plan	
	. Film - <u>Urban Sprawl vs Planned Growth.</u> 21 1/2 min. Service charge \$5.00
II.	II.

References

Land Use

BOOKS Munzer, M.E. <u>Planning Our Town</u>. New York: Alfred A. Knopf, 1964. Soil Conservation Society of America. <u>Planning and Zoning for Better Resource Use</u>. Anbeny, IA: The Society, 1971. U.S. Department of Agriculture. <u>A Place to Live - The Yearbook of Agriculture, 1963</u>. Washington, D.C.: U.S. Government Printing Office, 1963.	FILMS and FILM STRIPS National Association of Conservation Districts, The Green City. Film, 16 mm, color, 23 minutes, Service charge \$5.00. Environmental Film Service, P.O. Box 855, League City, TX 77573. Contemporary Films, <u>Cities of the Future</u>. Film, 16 mm, color, 25 minutes, Rental \$18.00. McGraw Hill, 327 West 41st., New York, N.Y. 10036. National Association of Conservation Districts, <u>Urban Sprawl vs Planned Growth</u>. Film, 16 mm, color, 21 1/2 minutes, Service charge \$5.00. Environmental Film Service, P.O. Box 855, League City, TX 77573. Educational Enterprise, <u>Cities Have No Limits</u>. Film, color, 53 minutes, rental \$24.40. NBC 30 Rockefeller Plaza, New York, N.Y. 10020.
BULLETINS	TRANSPARENCIES

UNIT: Population and Our Environment

OBJECTIVE(S): I. The student will be able to outline an elementary plan for controlling population problems for a given environment.

II.

UNIT: Population and Our Environment
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Outline an elementary plan for controlling population problems. A. Identify the major problems caused by overpopulation in a given environment. 1. Identify the major social, psychological and physical problems caused by overcrowding or overconcentration of population. a. Identify problems caused by overcrowded housing. b. Identify problems caused by overcrowded working conditions. c. Identify problems caused by overcrowded schools. d. Identify problems caused by overcrowded transportation facilities. e.	I. As a class project outline a plan or report on controlling population problems in the local area. A. 1. Individually or in small groups analyze (perhaps from personal experience) the local community or nearest town to identify environmental problems caused by overcrowded living conditions, e.g., overcrowded transportation facilities, homes, etc. . Interview the local town or county manager to determine problems caused by overcrowding. . Invite a social worker, psychologist or physician (or all of these people) to discuss the effects of overcrowding on health. . Compare and contrast living conditions in urban and rural areas. . Compare and contrast living conditions in overpopulated countries such as India with countries such as Australia.

UNIT: Population and Our Environment
SUB-UNIT:

TOPICS	RESOURCES
I. Population and our environment A. Effects of overcrowding 1. Overcrowded housing 2. Overcrowded working conditions 3. Overcrowded schools 4. Overcrowded transportation 5.	I-A. U.S. Department of Interior, <u>All Around You, An Environmental Study Guide</u>, pp. 35-40. . Myers. <u>The Environmental Crisis</u>, pp. 50-53 and 68-71. . Clemson University Extension Service, <u>General Population Characteristics, South Carolina, 1960-1970</u>. . Ehrlich. <u>Population/Resources/Environment</u>, Chapters 4, 5 and 6. . Film. <u>Population Ecology</u>. 19 min./\$8.25. . Film. <u>Population Ecology</u>. 13 min./\$9.00.

UNIT: Population and Our Environment
SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
2. Identify the major problems caused by overpopulation on our total supply of resources. a. Identify the major problems caused by a lack of adequate food supply. b. Identify the major problems caused by a lack of adequate land. c. Identify the major problems caused by a lack of adequate minerals. d. Identify the major problems caused by a lack of adequate forest and wildlife resources. e. 3. B. Identify the major causes of overpopulation, and overpopulated environment, i.e., family size tradition, religion, concentration of industry, economic and social advantages of concentration, etc.	2. Compare and contrast living conditions in countries having an abundance of natural resources and sparse populations with countries having a lack of natural resources and large populations. . Debate McKinders' heartland theory. B. Interview an industrialist to determine advantages of concentration of industry. . Compile a list of the advantages of industrial business and housing concentration. . Interview a sample of people to determine their desire for living near others. . Interview a sociologist to determine rationale for family size as related to religious beliefs, tradition, etc.

UNIT: Population and Our Environment
SUB-UNIT:

TOPICS	RESOURCES
2. Population and natural resource supplies a. Food supply b. Land supply c. Mineral supply d. Wildlife supply e. Recreational areas f. B. Causes of densely populated environment. 1. Increased total numbers of people . Birth rate . Increased life expectancy 2. Centralization . Industrial concentration 	A-2. U.S. Department of Interior. <u>All Around You, An Environmental Study Guide</u>, pp. 40-47. . Myers, Charles B., <u>The Environmental Crisis</u>, pp. 68-71. . Clemson University Extension Service. <u>General Population Characteristics, South Carolina, 1960-1970</u>. . Film. <u>The Population Explosion</u>. . Ehrlich, Paul R. <u>Population/Resources/Environment</u>, Chapter 4. B. Local industrialist . Sociology teacher . Ehrlich. <u>Population/Resources/Environment</u>, Chapter 11.

UNIT: Population and Our Environment

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
C. Predict population growth for a given environment 1. Locate local, state, and national census data 2. Interpret local, state and national census data. 3. D. List some of the major methods of population control. 1. List the major means of controlling the total population growth. a. List the major natural means of population control, e.g., old age, disease, accidental death, etc. b. List the major man-made means of population control, e.g., war, birth control, etc. c. 2. List at least _____ means of reducing population problems caused by over-concentration (overcrowding). a. List at least _____ means of reducing overcrowded housing problems. b. List at least _____ means of reducing overcrowded transportation facilities. c. List at least _____ means of reducing overcrowded schools. d. List at least _____ means of reducing overcrowded working conditions. e.	C. Locate and use census reports to determine population growth for the local area. . Have a local librarian demonstrate the use of census data. D. Interview local county or city planners to determine methods being used to control population growth. . Compile a list of the natural means of population control. . Interview local welfare agent to determine the measures being taken to control childbirth. 2. Interview local county or city planners to determine measures being used to reduce or prevent overcrowding. . Prepare a proposal for reducing overcrowded housing in a given area. . Prepare a proposal for reducing overcrowded transportation facilities in a given area. . Prepare a proposal for reducing overcrowded schools in a local area. . Prepare a proposal for reducing overcrowded working conditions in a local area.

UNIT: Population and Our Environment

SUB-UNIT:

TOPICS	RESOURCES
C. Population prediction . Local . State . Nation . World 	C. Census reports . County or city planning council or managers . Ehrlich, <u>Population/Resources/Environment</u>, Chapter 2.
D. Population control methods 1. Natural controls . Man-made controls 2. Population density control . Urbanization . Housing . Schools 	D. Ehrlich, <u>Population/Resources/Environment</u> , Chapter 2.

UNIT: Population and Our Environment

SUB-UNIT:

OBJECTIVES	LEARNING ACTIVITIES
3. List the measures being taken in the local community to control overcrowding. a. List the local agencies involved. b. List the major activities conducted by these agencies which have to do with controlling overcrowding. c. E. Outline a legislative program to present the local city or county council designed to reduce overcrowding in an area. II.	3. Interview local planners to determine the measures being taken to control overcrowding. E. Outline a legislative proposal to present to the local city or county council designed to create legislation to control overcrowding in the local area. II.

UNIT: Population and Our Environment

SUB-UNIT:

TOPICS	RESOURCES
3. Local measure to control overcrowding . Agencies involved . Major controls E. Legislative programs to control population problems. II.	3. Local county or city planners E. Ehrlich. <u>Population/Resources/Environment</u> , Chapters 11 and 13. II.

References

Population and Our Environment

BOOKS Ehrlich, Paul R. and Ehrlich, Anne H. <u>Population/Resources/Environment</u>. San Francisco: W.H. Freeman and Company, 1970. Myers, Charles B. <u>The Environmental Crisis: Will We Survive</u>. Englewood Cliffs, N.H.: Prentice-Hall, Inc., 1972.	FILMS and FILM STRIPS National Film Board of Canada. <u>The Population Explosion</u>. McGraw-Hill/#696789, Film-c/ 16mm/ 15 minutes/rent \$12.50. Bureau of Audio Visual Instruction. <u>Population Ecology</u>. Film/color/19 minutes/rental \$8.25. 1327 University Avenue, P. O. Box 2093, Madison, Wisconsin 53701. Encyclopedia Britannica Educational Films. <u>Population Ecology</u>. Film/color/13 min./\$9.00. 44424 Oakton Street, Skokie, Ill. 60076.
BULLETINS Clemson University Extension Service. General Population Characteristics - South Carolina 1960-1970. Clemson, South Carolina 29631, May 1972.	TRANSPARENCIES

CONSERVING AND UTILIZING THE ESSENTIALS OF OUR ENVIRONMENT

11

12

13

SUB-UNIT: Conserving and Utilizing Our Mineral Resources

OBJECTIVE(S): I. The student will be able to prepare an elementary plan for conserving and utilizing mineral resources in the local area.

II.

UNIT: Conserving and Utilizing the Essentials of Our Environment
 SUB-UNIT: Conserving and Utilizing Our Minerals

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Prepare an elementary plan for conserving and utilizing minerals in the local area. A. List at least _____ of the major minerals common to the local area. 1. Classify these minerals as to type, i.e., energy fuels (coal, petroleum) agricultural chemicals, construction minerals, industrial minerals, metals, etc. 2. Identify at least _____ of each of the types of minerals found in the local area. 3. Locate the sources of the layer deposits of minerals on a local map. 4. List the major consumers of chemicals in the local area. 5.	I. As a class project prepare an elementary plan for the conservation and use of minerals found in the local area. A. Interview a local geologist or member of the Bureau of Mines or Department of Interior who has knowledge about mineral resources in the local area, to determine mineral deposits and their location. . Make a collection of minerals mined and/or deposited in the local area. . Make a list of the major consumers of minerals and the types consumed in the local area, e.g., farmers, industries, citizens, etc. . Practice identifying mineral specimens.

UNIT: Conserving and Utilizing the Essentials of Our Environment
 SUB-UNIT: Conserving and Utilizing Our Minerals

TOPICS	RESOURCES
I. Conservation and utilization of minerals A. Major deposits in area 1. Types . agricultural . energy . construction . industrial 2. Identification 3. Sources 4. Consumers 5.	I-A. Local geologist, Bureau of Mines person, or Department of Interior Person. . Science teacher. . Fagan. <u>View of the Earth - An Introduction to Geology.</u> . Gallant and Schubert. <u>Discovering Rocks and Minerals.</u> . Ehrlich, Paul R. <u>Population/Resources/Environment</u>, pp. 58-63. . Film. <u>The Greatest Good</u>, 28 minutes. . Film. <u>Conserving Our Mineral Resources</u>, 11 min. . McNall and Kircher. <u>Our Natural Resources</u>, Chapters 5, 6 and 8.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Minerals

OBJECTIVES	LEARNING ACTIVITIES
B. List and locate the mining operations in the local area. 1. Classify these mining operations according to type, i.e., open pit, shaft, strip, etc. 2. Show by diagram the basic design of each of these types of mining. 3. Diagram an underground mine. 4. C. List the major abuses of mining in the local area. D. List the major laws in effect to prevent abuses. 1. List the major local agencies involved 2.	B. Visit a mine or mines in the local area to determine the type of operation and basic principles involved in removing the minerals. . Invite a local mine operator to visit the class and explain his operation. . Obtain a diagram of and/or prepare a diagram or an underground mine in the local area. C. Invite a member of the Bureau of Mines or Department of Interior to discuss local abuses of minerals. D. Determine the activities or programs conducted by local agencies to protect mineral deposits.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Minerals

TOPICS	RESOURCES
B. Mining operations in the local area 1. Types a. Surface . pit . strip . shaft b. Sub-surface . well . cavern 2. Removal principle 3. Underground mine structure 4. C. Laws and regulations 1. Federal 2. State 3. Local 4. Restoration regulations 5. Pollution control laws 6. D. Agencies involved 1. Federal 2. State 3. Local 4.	B. Bureau of Mines representative. . Mine operator. . Lewis and Clark. <u>Element of Mining.</u> . National Coal Association, <u>Coal.</u> . U.S. Department of Interior, <u>Surface Mining and Our Environment.</u> C. Local, State and Federal Bureau of Mines. . Lewis and Clark. <u>Elements of Mining.</u> D. Local, State and Federal Bureau of Mines. . Lewis and Clark, <u>Elements of Mining.</u>

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Minerals

OBJECTIVES	LEARNING ACTIVITIES
E. Prepare an elementary plan to restore a mineral area. 1. List the requirements imposed by law. 2. List the major objectives of restoration. 3. List the major steps in restoring a given mined site. 4. ... II. . . .	E. As a part of the overall class plan for the conservation and use of minerals found in the local area, plan a restoration program for a site. . Visit a restoration site, if possible. . Interview a member of the Bureau of Mines or Department of Interior to determine recommended restoration procedures. . Obtain and study a restoration plan from the Bureau of Mines. II. . . .

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Minerals

TOPICS	RESOURCES
E. Restoration	E. Lewis and Clark, <u>Elements of Mining.</u>
1. Goals	. U.S. Department of the Interior, <u>Surface Mining and Our Environment.</u>
2. Means	
3. Laws and regulations	II.
II.	

References

Conserving and Utilizing Our Minerals

BOOKS Ehrlich, Paul R. and Anne H. <u>Population/Resources/Environment</u>. San Francisco: W.H. Freeman and Company, 1970. Fagan, J.J. <u>View of the Earth - An Introduction to Geology</u>. New York: Holt, Rinehart, and Winston, Inc., Current Edition. Gallant, R.A. and Schubert, C.J. <u>Discovering Rocks and Minerals</u>. Garden City, N.Y.: The Nature History Press, 1967. Lewis, R.S. and Clark, G.B. <u>Elements of Mining</u>. New York: John Wiley and Sons, Inc., 1964. McNall, P.E. and Kircher, Harry B. <u>Our Natural Resources</u>. Danville, Illinois: The Interstate Printers and Publishers, Inc., 3rd ed., 1970. U.S. Department of Interior. <u>Surface Mining and Our Environment</u>. Washington, D.C., 1967. National Coal Association. <u>Coal</u>. Washington, D.C. The Association, 1966. BULLETINS	FILMS and FILM STRIPS Colorado Mining Association. <u>The Greatest Good</u>. 402 Maestic Building, 290 South 18th Street, Denver, Co. 80202. 28 min., free loan. University of South Carolina. <u>Conserving Our Mineral Resources</u>, Film/11 min./Service fee \$3.50. Audio-Visual Department, Division of Educational Services, Columbia, South Carolina 29208.	TRANSPARENCIES
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UNIT: Conserving and Utilizing the Essentials of Our Environment
 SUB-UNIT: Conserving and Utilizing Our Minerals

TOPICS	RESOURCES
E. Restoration 1. Goals 2. Means 3. Laws and regulations II.	E. Lewis and Clark, <u>Elements of Mining</u>. . U.S. Department of the Interior, <u>Surface Mining and Our Environment</u>. II.

UNIT: Conserving and Utilizing the Essentials of Our Environment

SUB-UNIT: Conserving and Utilizing Our Water

OBJECTIVE(S): I. The student will be able to design an elementary plan for the conservation and use of water for a given environment.

II.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Water

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Outline an elementary plan for the use and conservation of water for a given community or environment. A. Identify the major sources of water for a given environment. B. List the major uses of water in a given environment. 1. List and classify into categories the major uses of water, e.g., human consumption - (drinking, bathing, recreation, sewage disposal, etc.) industrial (cooling, processing, etc.) 2. Specify in rough percentages the amounts of water required for a given purpose, e.g., human consumption - %, etc. 3. C. List the major wastes or abuses of water in a given environment.	I. Prepare an elementary plan for the use and conservation of water for a typical community. A. Obtain and use a map of the local watershed to locate major sources of surface water. . Observe a diagram or diagram the hydraulic cycle. . Draw a map or make a model of the local watershed. . Invite a local conservationist to discuss the underground sources of water for the local community. B. As a class or small group project try to determine, with the help of local town officials, conservationist, and references, the amounts of water used for various purposes in your community. . Prepare a percentage chart showing the major uses of water in the community. C. See unit on water pollution.

UNIT: Conserving the Essentials of Our Environment
SUB-UNIT: Conserving Our Water Supply

TOPICS	RESOURCES
I. Conservation and use of our water supply A. Sources 1. Rain water 2. Surface water . lakes . rivers 3. Sub-surface water . springs . shallow wells . deep wells . artesian wells B. Uses 1. Agricultural 2. Industrial 3. Consumer . sewage disposal . recreation . drinking . bathing C. Waste and abuses 1. Pollution 2. Run-off 3.	I-A. USDA. <u>Outdoors USA, The Yearbook of Agriculture, 1967</u>, pp. 104-109 and pp. 183-186. . USDI. <u>Water for the Cities - the Outlook.</u> . Film. <u>The Living Sea.</u> . Ehrlich, Paul R. <u>Population Resources Environment</u>, pp. 185-189. . USDA. <u>Water, The Yearbook of Agriculture, 1955</u>, pp. 41-120 and pp. 655-663. . Film. <u>Aqua Folly</u>, 33 minutes. . Filmstrip. <u>Watershed Projects for Protection and Profits</u>, 53 frames, color. . McNall and Kircher. <u>Our Natural Resources</u>, Chapter 9. B. USDA. <u>Water, The Yearbook of Agriculture, 1955</u>, pp. 6-7, pp. 35-40 and pp. 653-654. . City water engineer. . Film. <u>How Water Helps Us</u>, 11 minutes. . Paper. "Has the United States Enough Water." C. See sub-unit on water pollution.

UNIT: Conserving the Essentials of Our Environment
SUB-UNIT: Conserving Our Water Supply

OBJECTIVES	LEARNING ACTIVITIES
D. Prescribe a water conservation program for a given environment or watershed. 1. List the major methods used to conserve water in a given environment. a. List the major methods of water storage commonly used in a given watershed. b. List the major methods used to prevent water runoff in a given environment. c. E. Plan a water supply system for a given community. 1. Determine the supply needs. 2. Determine the available sources - surface and subsurface. 3. Compare and contrast the efficiency of using an underground pumping system vs. a dam and reservoir. a. Identify the sources of surface water for a given community. (1) Measure the quantity of water supplied by such a source. (2) Select a reservoir site. (3) b. Identify the sources of underground water. (1) Measure the quantity of water available from a given underground source. (2) Select underground pumping sites. (3) c.	D. Interview a local conservationist to determine the measures being taken on the local watershed to conserve water. . Locate the reservoirs on a local watershed map or model. . Interview a member of the army corps of engineers or a civil engineer to discuss the water conservation plan for the local watershed. . Observe a demonstration of and/or construct a terrace. E. Outline an elementary plan of the water supply of a typical small town. . Interview the local water engineer to determine town water supply and needs. . Locate and file rain fall records for the local watershed. . Locate and determine the water holding capacity of the local reservoirs. . With the help of a city engineer or army corps of engineers determine the location, the depth of the water table and the location of underground water sources. . Diagram the path of water through the water system of a typical (or actual) small town water system.

UNIT: Conserving the Essentials of Our Environment
 SUB-UNIT: Conserving Our Water Supply

TOPICS	RESOURCES
D. Water conservation and use plan for a watershed . runoff reduction . storage . flood control E. Community water supply system 1. Supply determination 2. Sources . surface . sub-surface 3. Storage method 	D. Local soil conservationist. . Corps of army engineers representative. . Maps of local watershed. . Film. <u>Conserving Our Water Resource Today.</u> E. Local water or sanitation engineers. . Local conservationist. . Local urban planners. . Fair and Greyer. <u>Elements of Water Supply and Waste Water Disposal.</u> . Hardenbergh and Rodie. <u>Water Supply and Waste Disposal.</u>

UNIT: Conserving the Essentials of Our Environment
SUB-UNIT: Conserving Our Water Supply

OBJECTIVES	LEARNING ACTIVITIES
4. Diagram the water system of a typical (or actual) community from the reservoir through filtering, treatment, distribution, collection, sewage treatment and release or return. - Diagram the water system of a typical city block. - Diagram the sewage system of a typical city block. - Diagram the water system of a typical home. - Diagram the sewage system of a typical home. ... 5. Plan a water system for a typical rural home. - Diagram the water system of a typical rural home. - Diagram the sewage disposal system of a typical rural home. ... 6. ... F. Prescribe a water use and conservation program for a given farm. - Determine the major need. - Select an appropriate source. - Select an appropriate storage system. - Select an appropriate delivery system. - Select an appropriate treatment system. - Select an appropriate runoff control system. - Plan a farm irrigation system for a given farm. ... G. ... II. ...	. Diagram the water and sewage mains in a typical (or actual) city block. . Diagram the water and sewage system of a typical urban home. F. Diagram a water system for a typical rural home. . Prepare an elementary plan of water conservation for a typical farm. . Observe water collection and storage facilities on a farm. . Prepare a water runoff control plan. . Observe a demonstration of and/or layout contours of terrain. . Observe a demonstration of and/or construct a section of a terrace. . Observe demonstrations of the runoff and absorption of various soils, soil covers and soil slopes. II. ...

UNIT: Conserving the Essentials of Our Environment
 SUB-UNIT: Conserving Our Water Supply

TOPICS	RESOURCES
4. Delivery and return a. Cycle . storage . treatment . filtration . distribution . collection . sewage separation . treatment . return b. City water system c. Block sewage system d. Home water and sewage system e. 5. 6. F. Farm water use and conservation plan 1. Need determination 2. Sources 3. Storage 4. Delivery system 5. Treatment 6. Runoff control 7. II.	F. Local soil and water conservationist. . Local well driller. . Local plumber. (see unit on conserving and utilizing our soils) II.

References

Conserving and Utilizing Our Water Supply

BOOKS

Ehrlich, Paul R. and Ehrlich, Anne H. Population/ Resources/Environment. San Francisco: W.H. Freeman and Company, 1970.

Fair, Gordon M.; Geyer, John C. and Okum, Daniel A. Elements of Water Supply and Waste Water Disposal. New York: John Wiley and Sons, Inc., 2nd edition, 1971.

Hardenbergh, W.A. and Rodie, E.B. Water Supply and Waste Disposal. Scranton, Pa.: International Book Co., 1961.

McNall, P.E. and Kircher, Harry B. Our Natural Resources. Danville, Illinois: The Interstate Printers and Publishers, Inc., 3rd ed., 1970.

U.S. Department of Agriculture. Outdoors USA, The Yearbook of Agriculture. Washington, D.C.: U.S. Government Printing Office, 1967.

U.S. Department of Agriculture. Water, The Yearbook of Agriculture. Washington, D.C.: U.S. Government Printing Office, 1955.

BULLETINS, PAMPHLETS AND MAGAZINES

U.S. Department of the Interior. Water for the Cities - Outlook. Circular 601A, Washington, D.C.: U.S. Government Printing Office.

U.S. Department of the Interior. "Has the United States Enough Water?" Geological Survey Water-Supply Paper 1797. Washington, D.C.: U.S. Government Printing Office, 1965.

FILMS and FILM STRIPS

Boyd Film Company. Aqua Folly. Film/color/33 min./free. 1569 Selby Avenue, St. Paul, Mn. 55104.

National Association of Conservation Districts. Watershed Projects for Protection and Profit, No. C-128. Film/55 frames/color slides/\$9.00/filmstrip \$6.50. Environmental Film Service, P.O. Box 855, League City, TX 77573.

Audio-Visual Department, Division of Educational Service, University of South Carolina.

How Water Helps Us. 11 min./\$3.50.

Conserving Our Water Resources Today. 11 min/\$2.00.

TRANSPARENCIES

UNIT: Conserving and Utilizing the Essentials of Our Environment

SUB-UNIT: Conserving and Utilizing Our Wildlife Resources

OBJECTIVE(S):

- I. The student will be able to list the major uses and abuses of wildlife in a given community.
- II. List the essential requirements of at least one species of each type of wildlife.
- III. Plan a protection program for a given species of each of the major types of wildlife.
- IV. Prepare an elementary plan for increasing the population of a given type of wildlife.

V.

UNIT: Conserving and Utilizing the Essentials of Our Environment
 SUB-UNIT: Conserving and Utilizing Our Wildlife Resources

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. List the major uses and abuses of wildlife in a given community. A. List the criteria for assessing the use and abuse of wildlife in a given community. 1. Desired ecological balance 2. Desired type 3. Desired quantity 4. ... B. List the agencies involved in wildlife conservation in the local community. 1. List the major functions of such agencies. 2. List the major projects underway. 3. ... C. Assess the current wildlife population in a given area: 1. List ___ methods of determining wildlife population. 2. Classify the wildlife according to type and species. 3. Identify the ___ major species of wildlife in a given area. 4. ...	I-A. Invite a local wildlife protector to speak and discuss the uses and abuses of wildlife in the local area with the class. B. Invite a local wildlife protector to discuss functions of the agency represented. . Compile a list of local agencies involved. Also list the functions performed by each. . Visit a hunting reserve. C. Prepare a plan for assessing the wildlife population of a small forest plot. Check your plan with a local wildlife protector. . Observe the methods used by local wildlife protectors in assessing wildlife population. . As a class, survey a small forest and prepare a list of wildlife or evidence of wildlife (nest, etc.) observed. . Under the supervision of a wildlife protector, trap and release some of the more common wildlife in a small forest plot. . Using identification references, identify some of the more common animal life found in an area. . Construct a bird trap.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing our Wildlife Resources

TOPICS	RESOURCES
I. Uses and abuses of wildlife. A. Criteria for assessing uses and abuses . Ecological balance . Recreation value . Game value . Fur B. Agencies involved in regulating uses and abuses. . Agencies . Functions . Regulation and law enforcement . Game production C. Assessing a wildlife population. . Method of assessing . Trapping . Surveying clues - nesting, etc. Identification . Classification . Animals . Game . Furbearing . Endangered species Birds . Game . Predatory . Endangered species 	I-A. Local wildlife agency representatives. . USDA. Forest Service. <u>Wildlife Habitat Improvement Handbook.</u> . Film. <u>Problems of Conservation: Wildlife.</u> . Laycock, George. <u>America's Endangered Wildlife.</u> . S. C. Wildlife Resources Department. <u>South Carolina Wildlife.</u> . Film. <u>We Share This Land.</u> . Film. <u>Patterns of the Wild.</u> . McNall and Kircher. <u>Our Natural Resources,</u> Chapter 21. B. Local wildlife agency representative. C. Local wildlife agency representative. . USDA. Forest Service. <u>Wildlife Habitat Improvement Handbook.</u> . Shomon and Others. <u>Wildlife Habitat Improvement.</u> . Mosby. <u>Wildlife Investigational Techniques.</u>

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Wildlife Resources

OBJECTIVES	LEARNING ACTIVITIES
II. List the essential requirements of at least one species of each type of wildlife, i.e., (furbearing rabbit), (bird-quail), (fish-bass). A. Describe a life cycle of at least one species of each type of wildlife. B. List the feed requirements of at least one species of wildlife of each type. C. Describe in writing the habitat requirements for at least one species of wildlife of each type. D.	II. Through the use of reference materials, determine the life cycle of at least one species of each type of wildlife and prepare a diagram and/or poster depicting the cycle. . Through the use of references, determine the feeding and habitat requirements of at least one species of each type of wildlife of interest to you. . Construct an erect animal feeder for at least one species of wildlife. . Plant a wildlife cover crop for a species of wildlife. . Take and/or collect and file pictures of a selected species, e.g., a student might take and file pictures of birds. . Build a squirrel box.
III. Plan a protection program for a given species of each of the major types of wildlife. A. Plan a hunting schedule and bag limit. B. Plan insect disease, and predator protection program for a given species. C. Plan fire protection program for a given habitat. D.	III. Obtain and file a hunting schedule and bag limit for game animals in the local area. . Plan a hypothetical hunting schedule and bag limit for a given species of wildlife. . Prepare a written report on the pest of a selected species of wildlife.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Wildlife Resources

TOPICS	RESOURCES
II. Essential requirements of species. A. Life cycle B. Food requirements 1. Birds 2. Animals . Large . Small animals 3. C. Shelter requirements 1. Birds 2. Animals 3. D. Supplementary feeding 1. Cover crops 2. Hedge row plantings 3. III. Protection program A. Hunting regulations . Season . Bag limit B. Predator control C. Sanctuary establishment D. Fire control E. Disease and insect control F.	II. A. Local wildlife representatives. . Allen. <u>Everyday Animals.</u> . Selsam. <u>When an Animal Grows.</u> . USDA. <u>Forest Service. Wildlife Habitat Improvement Handbook.</u> . Shomon and Others. <u>Wildlife Habitat Improvements.</u> . S.C. Wildlife Resources Department. <u>South Carolina Wildlife.</u> III. Local wildlife representatives - especially game-wardens. . Allee and Others. <u>Principles of Animal Ecology.</u>

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Wildlife Resources

OBJECTIVES	LEARNING ACTIVITIES
IV. Prepare an elementary plan for increasing the population of a given type of wildlife. A. List the means of supplying food. B. List the steps involved in a breeding and rearing program. C. V.	IV. Under the supervision of a game warden, raise some small animals such as rabbits, or birds such as quail. . . . V.

UNIT: Conserving and Utilizing the Essentials of Our Environment

SUB-UNIT: Conserving and Utilizing Our Wildlife Resources

TOPICS	RESOURCES
IV. Species propagation	IV. Local wildlife representatives.
1. Supplementary food	. USDA. Forest Service. <u>Wildlife Habitat Improvement Handbook.</u>
2. Supplementary shelter	. Shonom and Others. <u>Wildlife Habitat Improvement.</u>
3. Supplementary protection	
4. Artificial propagation	V.
5.	
V.	

References

Conserving and Utilizing Our Wildlife Resources

BOOKS Allee, W.C. and Others. <u>Principles of Animal Ecology</u>. Philadelphia: Saunders, 1951. Allen, Gertrude F. <u>Everyday Animals</u>. Boston: Houghton Mifflin, 1966. McNail, P.E. and Kircher, Harry B. <u>Our Natural Resources</u>. Danville, Illinois: The Interstate Printers and Publishers, Inc., 3rd ed., 1970. Laycock, George. <u>America's Endangered Wildlife</u>. New York: Norton, 1969. Mosby, H.S. <u>Wildlife Investigational Techniques</u>. Washington, D.C.: The Wildlife Society, 1967. Selsan, Millicent E. <u>When an Animal Grows</u>. New York: Harper and Row, 1966. Shomon, J.J. and Others. <u>Wildlife Habitat Improvement</u>. New York, N.Y.: National Audubon Society, 1966. USDA, Forest Service. <u>Wildlife Habitat Improvement Handbook</u>. Washington, D.C.: U.S. Government Printing Office, 1968. S.C. Wildlife Resources Department. <u>South Carolina Wildlife</u>. (magazine)	FILMS and FILM STRIPS Encyclopedia Britannica Educational Corporation. <u>Problems of Conservation</u>. Wildlife. U.S. Department of Agriculture. Films available from State Film Libraries. Write to Motion Picture Library Service, Office of Information, U.S. Department of Agriculture, Washington, D.C. 20250 for locations of lending libraries. Film. <u>Patterns of the Wild</u>. 16 mm/color/26 min. Film. <u>We Share This Land</u>. 16 mm/color/14 min.
	TRANSPARENCIES
BULLETINS	

UNIT: Conserving and Utilizing the Essentials of Our Environment

SUB-UNIT: Conserving and Utilizing Our Soils

OBJECTIVE(S): I. Prepare a conservation and use plan for a given soil.

II.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Using Our Soil

OBJECTIVES	LEARNING ACTIVITIES
I. Prepare a conservation and use plan for a given site. A. Classify a given soil according to one of the eight recognized classes. 1. List the criteria used in classifying soil, e.g., texture structure, slope, drainage, etc. 2. Outline the standard score card used in classifying soils. 3. List the specification for each item on the score card, e.g., topsoil thickness 0-6" equal Class II, etc. 4. Differentiate between various topsoil and subsoil textures, structures, consistencies. 5. Differentiate between various levels of topsoil and subsoil thickness - permeability and drainage. 6. Determine the slope of a given area. 7.	I-A. 1. Observe demonstrations of soil classification. 2. Participate in the FFA land classification contest. 3. Practice the following skills using soil samples: determining texture determining structure determining consistency determining permeability 4. Practice determining slope. 5. Practice determining drainage.

UNIT: Conserving and Utilizing the Essentials of Our Environment

SUB-UNIT: Conserving and Utilizing Our Soil

TOPICS	RESOURCES
I. Use and conservation of land used for agriculture and forestry. A. Soil classification 1. Topsoil . texture . structure . consistency 2. Subsoil . texture . structure . consistency . permeability 3. Slope 4. Drainage 5.	I-A. . McNall and Kircher. <u>Our Natural Resources</u>, Chapters 16-19. . Clemson University. <u>Soil Judging and Land Treatment</u>, Circular 390. . USDA. <u>Teaching Soil and Water Conservation</u>, PA341. . Welch and Others. <u>An Introduction to Soil Science in the Southeast</u>. . Film. <u>The Ecology of Cultivated Areas</u>. . Film. <u>The Story of Soil</u>. 16 minutes, rental \$12.50.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Soil

OBJECTIVES	LEARNING ACTIVITIES
B. Recommend cultural practices to be used on a given land class. 1. Select appropriate crop rotation for a given class of land. 2. Select appropriate mechanical treatments for a given class of land. a. Layout a drainage line for a given plot. b. Layout a terrace for a given slope and soil. c. Layout a contour for a given slope and soil. d. Select an appropriate vegetative cover for a given slope and soil. II	B. Layout or observe demonstration of a contour. . Layout or observe a demonstration of the layout of a terrace. . Establish a windbreak planting. . Establish a vegetative cover or mulch to prevent soil erosion. . Layout or observe a demonstration of the layout of a drainage line. II

UNIT: Conserving and Utilizing the Essentials of Our Environment

SUB-UNIT: Conserving and Utilizing Our Soil

TOPICS	RESOURCES
B. Recommend conservation practices. . crop rotation . drainage . open ditch . tile terracing . contouring . cover crop . mulch . fertilization 	B. Clemson University. <u>Soil Judging and Land Treatment</u> , Circular 390. . USDA. <u>Teaching Soil and Water Conservation</u>, PA341. . USDA. <u>Grass Waterways in Soil Conservation</u>, Leaflet 477. . Welch and Others. <u>An Introduction to Soil Science in the Southeast</u>.
II.	II.

References

Conserving and Utilizing Our Soils

BOOKS McNall, P.E. and Kircher, Harry B. <u>Our Natural Resources</u>. Danville, Illinois: The Interstate Printers and Publishers, Inc., 3rd ed., 1970. Welch, Charles D. and Gerald D. McCort. <u>An Introduction to Soil Science in the Southeast</u>. Chapel Hill, N.C.: The University of North Carolina Press, 1963.	FILMS and FILM STRIPS University of South Carolina. <u>The Story of Soil, Film/11min./Service charge \$2.00. Audio Visual Aids Department, Division of Educational Services, Columbia, S.C. 29208.</u> McGraw-Hill. <u>The Ecology of Cultivated Areas, No. 613618, Film/16mm/16min./Rent \$12.50. Text-Film Division, 330 West 42nd St., New York, New York 10036.</u>
BULLETINS Clemson University Extension Service. <u>Soil Judging and Land Treatment, Circular 390. Clemson University, Clemson, South Carolina 29631.</u> USDA. Superintendent of Documents, Washington, D.C. 20402. <u>Teaching Soil and Water Conservation, PA341 and Grass Waterways in Soil Conservation, Leaflet 477.</u>	TRANSPARENCIES

UNIT: Conserving and Utilizing the Essentials of Our Environment

SUB-UNIT: Conserving and Utilizing Our Forests and Wilderness

OBJECTIVE(S): I. Plan a forest or wilderness conservation and utilization program
for a given forest or wilderness.

II.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Forests and Wildernesses

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Plan a forestry or wilderness conservation program for a given forest or wilderness. A. List the major uses and abuses of forests and wilderness in a given community. 1. List the major uses of forests and wilderness in a given community. 2. List the major abuses of forests and wilderness in a given community. 3. List agencies or people involved in the preservation of forest, wilderness, and wild-life resources. 4. ... B. Assess the present and potential use of a given forest or wilderness. 1. Assess the economic value of a given forest or wilderness. a. Using a Biltmore Stick estimate the amount of timber in a given tree. b. Estimate within 100 board feet the amount of timber in a small plot. c. ...	I. Prepare a reference file on forestry conservation. A. Write S. C. Forestry Commission or U. S. Congressman for information on forestry conservation. . Compile a list of local agencies involved in forestry conservation. . Survey the local community to determine the uses and abuses of forests. A county forest ranger, extension agent, or a forester working with a local pulpwood company might be able to help you organize this project. . Interview a local forester, extension agent, county ranger or commercial forester. . Take field trips to local forest to observe uses and abuses. B. Analyze a local forest area in terms of economic, recreational, esthetic and ecological values. . Observe demonstrations of and/or estimate the number of board feet of lumber in a tree--or plot of trees. . Plan a field trip to a forest area and evaluate the forest in terms of its ecological value, i.e. the sheltering of animal life, the conservation of soil, the production of oxygen, etc.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Forests and Wilderness

TOPICS	RESOURCES
I. Forests and wilderness conservation. A. Uses and abuses 1. Major uses 2. Major abuses 3. Agencies involved in conservation 4. ... B. Present and potential uses of forests. 1. Economic value 2. Recreational value 3. Esthetic value 4. Ecological value 5. ...	A. Local foresters • Kirkley, Frank E. <u>Basic Forestry for Vocational Students in South Carolina.</u> • Local forest fire rangers • Local foresters with commercial concerns - paper companies, etc. • Film. <u>The Forest Produces Part II (Living Forest Series)</u>, 11 min. • Film. <u>From Forest to Lumber</u>, 14 min. • Film. <u>Forest Conservation Part III (Living Forest Series)</u>, 11 min. B. Local foresters • Kirkley, Frank E. <u>Basic Forestry for Vocational Students in South Carolina.</u> • Local foresters with commercial concerns • Film. <u>How Trees Help Us</u>, 11 min. • Film. <u>Leaf</u>, 7 min. • Film. <u>Life in the Deciduous Forest</u>, 19 min. • Film. <u>Life in the Forest</u>, 10 min. • Film. <u>Plant - Animal Communities: Ecological Succession</u>, 13 1/2 min. • Film. <u>Adventures in Conservation</u>, 14 min. • Film. <u>Deep Roots</u>, 39 min. • Film. <u>Extra Forest Dollars</u>, 20 min. • Anderson and Smith. <u>Forests and Forestry</u>, pp. 11-14.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Forests and Wilderness

OBJECTIVES	LEARNING ACTIVITIES
2. Assess the recreational value of a given forest or wilderness. a. List <u> </u> criteria of a desirable forest area for recreational purposes. b. ... 3. Assess the esthetic value of a given forest or wilderness. a. List <u> </u> criteria for judging the beauty of a forest. b. ... 4. Assess the ecological value of a given forest or wilderness. a. List <u> </u> means in which a given forest aids the ecosystem it is in. b. ... 5. ... C. Plan a harvest program for a given forest or wilderness consistent with good conservation practice. 1. Plan a harvest program for a given forest or wilderness using good conservation practices. a. List the major timber products, i.e., timber, poles, fence posts, pulpwood, etc. b. Differentiate among trees according to use potential, i.e., trees 10" in diameter and above - timber, etc. c. ... 2. Describe in writing the ways in which good harvesting practices complement good conservation practices.	. Plan a field trip to identify some of the layer ecosystems the forest protects. . Compare forests as to their beauty--natural beauty--beauty in the form of individual trees. . Make a collection of photos of individual trees silhouetted against the sky to show form. C. Visit forests and classify them as to maturity . Observe demonstrations of and/or determine the age of a tree(s) by counting growth rings. . Observe demonstrations of and/or determine the yearly growth of a tree(s) by observing the width between growth rings. . Compare and contrast soil, stand thickness and other factors and the growth rate of trees. . If feasible visit sites where harvesting is in process and observe damage caused by different methods.

UNIT: Conserving and Utilizing the Essentials of Our Environment
 SUB-UNIT: Conserving and Utilizing Our Forests and Wilderness

TOPICS	RESOURCES
C. Harvesting consistent with conservation. 1. Major timber products 2. Harvesting a. Determining when to cut b. Means of cutting c. Seasonal effects of harvesting d. ...	C. Local foresters . Local foresters with commercial concerns . Anderson and Smith. <u>Forests and Forestry</u>, Chapters 8 and 10. . Kirkley, Frank E. <u>Basic Forestry for Vocational Students in South Carolina.</u> . Film. <u>Marketing Pulpwood</u>, 12 min.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Forests and Wilderness

OBJECTIVES	LEARNING ACTIVITIES
a. Determine when a given forest should be cut. (1) Determine the maturity of a given tree by growth rings. (2) Determine the rate of growth of a given tree by observing growth rings. b. Select the most appropriate means of cutting, i.e., selective cutting, clear cutting, etc. c. Select the most appropriate season for cutting to produce the least damage to the forest. d. ...	
D. Plan a reforestation program for a given land area. 1. Select an appropriate method, i.e., seedlings, seed tree, air seeding, etc. a. Plant a pine tree seedling according to recommended steps. b. List criteria for evaluating a seedbed. c. Cite at least one reference which gives recommended planting times, distances, etc. d. ... 2. Select appropriate variety for maximum use potential.	D. As a class project, establish a small planting of trees for a local farmer or other citizen. . Establish a school forestry plot. . As a class project, plant trees on a small area as a wind break or for erosion control. . Remove weed trees from a small forest plot. . Thin a small plot of growing timber. . Visit reforestation areas in the local community.

UNIT: Conserving and Utilizing the Essentials of Our Environment
 SUB-UNIT: Conserving and Utilizing Our Forests and Wilderness

TOPICS	RESOURCES
D. Forest Restoration 1. site preparation 2. variety selection 3. planting method 4. cultural practices during establishment 5. ...	D. Local foresters . Anderson and Smith. <u>Forests and Forestry</u>, Chapter 6. . Clemson University Extension Service. Information card No. 88. "Forest Tree Planting Guide, South Carolina." . Clemson University Extension Service. Information card No. 93. "Getting Open Land Ready for Planting Pines." . McNall and Kircher. <u>Our Natural Resources</u>, Chapters 10 and 11.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Forests and Wilderness

OBJECTIVES	LEARNING ACTIVITIES
a. List at least one reference which gives recommended varieties for a given geographic area and for a given purpose. b. ... 3. List the major cultural practices to be used in the production of a given forest crop. a. Prepare and/or obtain a thinning, pruning and weeding schedule for a typical reforested site. b. Identify weed trees in a given plot of trees. c. ... E. Plan a forestry protection program for a given forest or wilderness. a. Select the number and type of fire lanes needed. b. Calculate a fire danger index. c. Demonstrate the ability to determine the direction and distance of a hypothetical smoke when given azimuth reading from two towers. d. Explain by diagram the principle of a back fire as a means of stopping a fire. e. ...	E. 1. Observe the construction of fire lanes. Visit a fire tower and practice locating a hypothetical or real smoke using the map table. Practice determining a fire danger index. Observe a demonstration of fire control by back fire, by fire lane and by the use of flaps or water guns. ...

UNIT: Conserving and Utilizing the Essentials of Our Environment
 SUB-UNIT: Conserving and Utilizing Our Forests and Wilderness

TOPICS	RESOURCES
E. Pest control 1. Fire control a. fire index determination b. fire lanes c. back fires d. control burning e. ...	E. Film. <u>The Burning Issue</u>, 14 min. . Film. <u>Forest Fire Fighting in the South</u>, 39 min. . Film. <u>The Friendly Fire</u>. . Anderson and Smith. <u>Forests and Forestry</u>, Chapter 13. . Film. <u>A Fire Called Jeremiah</u>.

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Conserving and Utilizing Our Forests and Wilderness

OBJECTIVES	LEARNING ACTIVITIES
2. List and Identify 6 of the more common tree insects and locate a reference which gives recommended control measures. 3. List and identify at least 6 of the more common tree diseases and locate a reference which gives recommended control measures. II. ...	2. Collect samples of the more common or damaging tree insects. . Obtain and file a reference on identification and control of forest insects. 3. Collect samples of the more common or damaging tree diseases. . Obtain and file a reference on the identification and control of forest insects. . Observe damage caused by such insects. II. ...

UNIT: Conserving and Utilizing the Essentials of Our Environment
 SUB-UNIT: Conserving and Utilizing Our Forests and Wilderness

TOPICS	RESOURCES
E-2. Insects a. insect identification b. insect control c. ... 3. Diseases a. identification b. control c. ... II.	E. Bulletin USDA. <u>Insects and Diseases of Trees in the South.</u> II.

References

Conserving and Utilizing Our Forests and Wilderness

BOOKS Anderson, David A. and William A. Smith. <u>Forests and Forestry</u>. Danville, Illinois: The Interstate Printers and Publishers, Inc., 1970. Kirkley, Frank E. <u>Basic Forestry for Vocational Students in South Carolina</u>. Clemson, S. C.: Vocation Education Media Center, 1974. McNall, P.E. and Kircher, Harry B. <u>Our Natural Resources</u>. Danville, Illinois: The Interstate Printers and Publishers, Inc., 3rd ed., 1970.	FILMS and FILM STRIPS Films available from The South Carolina State Commission of Forestry. P. O. Box 287, Columbia, S. C. 29202. <u>Adventures in Conservation</u>, 14 min. <u>Deep Roots</u>, 39 min. <u>Extra Forest Dollars</u>, 20 min. <u>Forest Conservation Part III (Living Forest Series)</u>, 11 min. <u>From Forest to Lumber</u>, 14 min. <u>How Trees Help Us</u>, 11 min. <u>Leaf</u>, 7 min. <u>Life in the Deciduous Forest</u>, 19 min. <u>Life in the Forest</u>, 10 min. <u>Marketing Pulpwood</u>, 12 min. <u>Plant - Animal Communities: Ecological Succession</u>, 13 1/2 min.
BULLETINS Clemson University Extension Service, Clemson, South Carolina 29631. "Forest Tree Planting Guide, South Carolina," Information Card No. 88. "Getting Open Land Ready for Planting Pine Trees," Information Card No. 93.	TRANSPARENCIES

UNIT: Conserving and Utilizing the Essentials of Our Environment

SUB-UNIT: Exploring Career Opportunities

- OBJECTIVE(S):
- I. The student will be able to compare and contrast career opportunities related to the conservation and use of the essentials of our environment.
 - II. The student will be able to list the ways in which a given career related in this area complements or fails to complement life goals.

III.

UNIT: Conserving and Utilizing the Essentials of Our Environment
 SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Compare and contrast the career opportunities related to the conservation and use of the essentials of our environment. A. List the major career opportunities related to the conservation and use of the natural resources. B. Classify the career opportunities as to occupational levels, i.e., professional, technical, service, etc. C. List the major competencies needed for at least one career related to each of the natural resources. D. List the major activities performed by a person employed in at least one occupation associated with each of the natural resources. E. List the educational requirements of a person employed in at least one occupation associated with each of the natural resources. F.	I. Interview as many people employed in the conservation and use of natural resources as is feasible. • Prepare an in-depth report on the two occupations of most interest. • Perform as many of the tasks encountered by people employed in the job or jobs of most interest as is feasible. • Arrange to spend a day or afternoon with a person holding a job of your choice. • Seek occupational work experience in the occupation of your choice. • If the career choice involves further schooling, investigate with your guidance counselor the schools available. • Have students play "What's My Line" using careers in natural resources conservation and use for "the mystery guest." •

UNIT: Conserving and Utilizing the Essentials of Our Environment
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
I. Career opportunities in conserving and utilizing the essentials of our environment. A. Careers 1. Minerals . Restoration worker . Open pit mine conservation inspector . Mineralogist . Geologist 2. Water . Sewage worker . Public health engineering aide . Soil and water conservationist 3. Wildlife . Game warden . Wildlife biologist 4. Soil . Surveyor's assistant . Soil conservation aide . Soil scientist . Soil conservationist 5. Forest . Tree planter . Forestry aide . Forest cruiser . Forest fire ranger . Forester . Forest entomologist B. Occupational classification . Professional . Technical . Entry level C. Competencies needed D. Training needed E.	I. Local people employed in occupations involving the conservation and use of the natural resources. . U.S. Department of Health, Education and Welfare. <u>Exploring Occupations in the Natural Resources</u>, A resource guide for grades 7-8-9. . Hoover. <u>Handbook of Agricultural Occupations</u>, pp. 263-307. . Fanning. <u>Opportunities in Environmental Careers</u>, Chapter 8. . Filmstrip: <u>Careers in Natural Resource Management</u>, 53 frames.

UNIT: Conserving and Utilizing the Essentials of Our Environment
 SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
II. List the ways in which a given career associated with the conservation and use of the essentials of the environment complements or fails to complement life goals. A. List the ways in which a given career benefits society. B. List the ways in which a given career might benefit the student. C. . . .	II. Prepare a short paper concerning the ways in which a chosen career would complement or fail to complement life goals. . Participate in a classroom debate of life goals. . As a class project, prepare hypothetical radio programs on careers. Have each student act as disc jockey and record a brief job description and play a favorite record.
III. . . .	III. . . .

UNIT: Conserving and Utilizing the Essentials of Our Environment

SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
II. Career benefits A. Benefits to society B. Benefits to individual C. II.	II. Fanning. <u>Opportunities in Environmental Careers</u>, Chapter 12. III.

References

Exploring Career Opportunities

BOOKS Fanning, Odom. <u>Opportunities in Environmental Careers</u>. New York: Universal Publishing and Distributing Company, 1971. Hoover, Norman K. <u>Handbook of Agricultural Occupations</u>. Danville, Illinois: The Interstate Printers and Publishers, Inc., 2nd edition, 1969. U.S. Department of Health, Education and Welfare. <u>Exploring Occupations in the Natural Resources, A Resource Guide for grades 7-8-9</u>. Washington, D.C.: U.S. Government Printing Office, 1973.	FILMS and FILM STRIPS California State Polytechnic College. <u>Careers in Natural Resource Management</u>. Filmstrip No. 180, 53 frames, color, \$7.95. Vocational Productions, San Luis Obispo, California 93401.
BULLETINS	TRANSPARENCIES

MAINTAINING OR IMPROVING ENVIRONMENTAL HEALTH

UNIT: Maintaining or Improving the Health of Our Environment

SUB-UNIT: Planning for a Healthy Environment

OBJECTIVE(S): I. Prepare an elementary program to improve the health aspects of a given environment.

II.

UNIT: Maintaining or Improving the Health of Our Environment
 SUB-UNIT: Planning for a Healthy Environment

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Plan a health control program for a given environment. A. Identify and list the health problems of a given area which are a result of environmental factors. 1. List the major effects of air pollution on human health. 2. List the major effects of water pollution on human health. 3. List the major effects of noise pollution on human health. 4. List the major effects of solid waste pollution on human health. 5. List the major effects of radiation pollution on human health. 6.	I. Outline a health control plan for the local community. . Seek work experience in the area of environmental health. A. Survey the local community to determine the major environmental health hazards. . Obtain available information on environmental hazards in your community from local agencies involved, i.e., EPA, health dept., etc. . Invite a local physician to serve as a resource person to discuss local health problems resulting from environmental pollution. . Classify the major pollutants according to sources, i.e., air, water, solid waste, noise, etc. . Obtain and discuss case history of health problems caused by pollution.

UNIT: Maintaining or Improving the Health of Our Environment
SUB-UNIT: Planning for a Healthy Environment

TOPICS	RESOURCES
I. Environmental health A. Effects 1. Effects on human health a. Air pollution . Lungs . Chemical poisoning . Bacterial infection b. Water pollution . Chemical poisoning . Bacterial infection c. Noise . Hearing . Nervous system d. Solid waste . Indirect . Water pollution . Air pollution . Direct . Flies . Disease bearing organisms e. Radiation pesticides f. 2. Effect on ecosystems . . .	I-A. Local EPA representatives. . Local physicians . Ehrlich. <u>Population/Resources/Environment</u>, Chapter 6. . Dubos. <u>Man Adapting</u>. . Filmstrip. <u>Air Pollution and You</u>. . Film. <u>The Garbage Explosion</u>. 16 minutes. 2. Ehrlich. <u>Population/Resources/Environment</u>, Chapter 7. . . .

UNIT: Maintaining or Improving the Health of Our Environment
SUB-UNIT: Planning for a Healthy Environment

OBJECTIVES	LEARNING ACTIVITIES
B. Describe in writing the major programs being conducted in the local community, to provide a more healthy environment. 1. List the functions of the local agency or agencies involved in controlling air pollution. 2. List the functions of the local agency or agencies involved in controlling water pollution. 3. List the functions of the agency or agencies involved in controlling noise pollution in the local community. 4. List the major antipollution health laws operative in the local community. 5.	B. Invite a local EPA person to serve as a resource person for the class to discuss the going progress of environmental pollution. . Interview, as an individual or as a class, people involved in maintaining a healthy environment, e.g., EPA personnel, health department personnel, etc. . Visit local industries and interview personnel to see what is being done to prevent air pollution. . Debate the pros and cons of antipollution laws.

UNIT: Maintaining or Improving the Health of Our Environment
SUB-UNIT: Planning for a Healthy Environment

TOPICS	RESOURCES
B. Environmental program 1. Agencies 2. Programs 3. Laws 4.	B. Local EPA representatives . Local city or county planners . Local health representatives

UNIT: Maintaining or Improving the Health of Our Environment
SUB-UNIT: Planning for a Healthy Environment

OBJECTIVES	LEARNING ACTIVITIES
C. Plan an air pollution control program for a given environment. 1. List and classify the major methods used in controlling different types of air pollution, e.g., natural (rain), artificial (filters), process change (substituting fuels used), etc. 2. Diagram or otherwise describe the basic design principle of the equipment or processes used to prevent air pollution, e.g., smoke stack filters - basic principles involve a chemical filter, auto exhaust - basic principle is to provide a more complete burn, etc. 3. List at least _____ means of measuring air pollution. 4. List the major sources of air pollution. 5. List the effects of weather on air pollution. 6. List the effects of time of day and season on air pollution. 7.	C. Diagram some of the basic equipment used in industry for air pollution control. . Locate sources of air pollution at home or school. . Observe demonstrations of and/or measure the amount of air pollution using different equipment. . Visit an industrial plant and observe the air pollution equipment being used. . Prepare an air pollution index report. . Obtain and file the air pollution index report for the past year from the local area. Study the seasonal variations.

UNIT: Maintaining or Improving the Health of Our Environment
 SUB-UNIT: Planning for a Healthy Environment

TOPICS	RESOURCES
C. Air pollution control 1. Methods . Natural . weather Zoning . Process change . Use of control equipment 2. Equipment . Design principles 3. Sources of air pollution . Industry . Automobiles . Agriculture . People 4. Effects of weather	C. Local EPA representative. . Air Pollution Control Association, <u>Air Pollution Experiments for Junior and Senior High School Science Classes</u>. . Corman, <u>Air Pollution Primer</u>. . Ehrlich, <u>Population/Resources/Environment</u>, pp. 118-24 also pp. 145-48. . Film, <u>The Answer is Clear</u>. 14 min. . Film, <u>Air Pollution: Take a Deep Deadly Breath</u>. 54 min./rent \$40.00. . Kit, "Air Pollution Study Program." Kits for experiments on detection and analysis. . Henson, <u>Your Environment/Air Pollution and Weather</u>, pp. 165-162.

UNIT: Maintaining or Improving the Health of Our Environment
SUB-UNIT: Planning for a Healthy Environment

OBJECTIVES	LEARNING ACTIVITIES
D. Plan a water pollution control program for a given environment. 1. List the major methods used in controlling different types of water pollution, e.g., factory waste, agricultural waste, sewage, etc. 2. Diagram or otherwise overtly describe the basic design principles of the equipment used or the basic processes involved in the reduction or prevention of water pollution, e.g., filters or water coolers, etc. 3. List the major test used in determining water quality. 4. Conduct some of the simpler tests used to determine water quality. 5. List at least three methods of treating waste waters. 6.	D. Locate a source of water pollution at home or school. . Diagram the working principle of some of the equipment used in industry to reduce water pollution. . Select and implement a home project in environmental health improvement. . Diagram a sewage disposal system for a farm home. . Visit an industrial plant and observe or have a company representative describe the methods or processes used to treat waste water. . Visit a city sewage plant and have the manager describe the methods used in treating sewage water.

UNIT: Maintaining or Improving the Health of Our Environment
 SUB-UNIT: Planning for a Healthy Environment

TOPICS	RESOURCES
D. Water pollution 1. Methods of control a. Mechanical equipment b. Regulation of waste disposal c. Chemical disinfection d. Waste water treatment 2. Equipment design 3. Pollution tests 4. Waste water treatment 5.	D. Local EPA representatives. . Local sewage plant manager. . Local water engineer. . Ehrlich. <u>Population/Resources/Environment</u>, pp. 125-28. . Fair and Others. <u>Elements of Water Supply and Waste Water Disposal.</u> . U.S. Government Printing Office. <u>A Primer on Waste Water Treatment.</u>

UNIT: Maintaining or Improving the Health of Our Environment
SUB-UNIT: Planning for a Healthy Environment

OBJECTIVES	LEARNING ACTIVITIES
E. Plan a solid waste disposal system for a given environment. 1. Diagram or otherwise describe the basic processes involved in a typical sewage disposal system. 2. List the means by which solid waste can be safely disposed. 3. F. Plan a noise pollution program for a given environment. 1. List several alternative means of noise reduction. 2. List at least ____ means of measuring sound. a. Operate sound measuring equipment. b. G. II.	E. Diagram a home sewage system. . Visit a city sewage system. . Locate sources of solid waste pollution at home or school. . Diagram a city sewage system. . Visit a landfill. F. Conduct sound experiments using different sound absorbing materials and baffles. . Measure noise pollution in different locations-- school classroom, busy street corner, airport, machine shop, factory, home, etc. . Visit a local industrial plant and observe noise suppression equipment. . Observe the effect of carpeted floors. G. II.

UNIT: Maintaining or Improving the Health of Our Environment
SUB-UNIT: Planning for a Healthy Environment

TOPICS	RESOURCES
E. Solid waste pollution 1. Methods of disposal a. Landfills b. Sewage disposal plants c. 2. Sewage disposal systems a. City system . collection . separation . filtration . treatment b. Farm sewage disposal system . septic tank . sewer line . absorption bed F. Noise pollution 1. Methods . baffles . sound absorbent materials 2. Measurement 3. II.	E. Local sewage plant manager. . Local water engineer. . U.S. Government Printing Office. <u>A Primer on Waste Water Treatment.</u> . Fair and Others. <u>Elements of Water Supply and Waste Water Disposal.</u> F. Local EPA representatives. . Ehrlich. <u>Population/Resources/Environment</u>, pp. 139-41. . Albess. <u>The World of Sound.</u> (A non-technical guide to the science of acoustics.) II.

References

Planning For a Healthy Environment

BOOKS Albess, V.M. <u>The World of Sound</u>. Cranbury, New Jersey: A.S. Bornes Company, 1970. Corman, R. <u>Air Pollution Primer</u>. New York, N.Y.: National Tuberculosis and Respiratory Disease Association, 1969. Dubos, Rene. <u>Man Adapting</u>. New Haven: Yale University Press, 1965. Ehrlich, Paul R. and Anne H. <u>Population/Resources/Environment</u>. San Francisco, California: W.H. Freeman and Company, 1970. Fair, G.M. and J.C. Greyer. <u>Elements of Water and Waste Water Disposal</u>. New York, N.Y.: John Wiley and Sons, Inc., 1968. Henson, Collins M. <u>Your Environment/Air, Air Pollution and Weather</u>. Danville, Illinois: The Interstate Printers & Publishers, Inc., 1971. U.S. Department of the Interior. <u>A Primer on Waste Water Treatment</u>. Washington, D.C.: U.S. Government Printing Office.	FILMS and FILM STRIPS Contemporary Films/McGraw-Hill. <u>Air Pollution: Take a Deep Breath</u>. 327 West 41st Street, New York, N.Y. 10036. 54 minutes, rent \$40.00 Modern Talking Picture Service, Inc. <u>The Answer is Clear</u>. 2323 New Hyde Park, N.Y. 11040. U.S. Department of HEW. <u>Air Pollution and You</u>. Film/46 frames/color. Encyclopedia Britannica Educational Corporation. <u>The Garbage Explosion</u>. Film/c-BW/16 mm/16 min./S.C. \$200.00
BULLETINS	TRANSPARENCIES Posters. Argus Communications, 3505 North Ashland Avenue, Chicago, Illinois 60657. Kits. "Air Pollution Study Program." Eduquip, Incorporated, 1220 Adams Street, Boston Massachusetts 02124. Kits for experiments on detection and analysis.

UNIT: Maintaining or Improving the Health of Our Environment

SUB-UNIT: Career Exploration

OBJECTIVE(S): I. The student will be able to compare and contrast career opportunities related to maintaining and improving the health of our environment.

II. The student will be able to list some of the ways in which a chosen career in this area complements or fails to complement life goals.

III.

UNIT: Maintaining and Improving a Healthy Environment
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Compare and contrast the career opportunities related to maintaining and improving the health of our environment. A. List the major career opportunities related to the maintenance or improvement of the health aspects of our environment. B. Classify the career opportunities as to occupational levels, i.e., professional, technical, service worker, etc. C. List the major competencies needed for at least one career related to each of the major occupational areas, e.g., air pollution. D. List the major activities performed by a person employed in at least one occupation associated with each of the major occupational areas, e.g., solid waste pollution. E. List the educational requirements of at least one job in each of the major occupational areas, e.g., water pollution. F.	I. Interview people employed in careers related to the maintenance or improvement of environmental health. . Prepare an in-depth report on at least two occupations of special interest. . Perform some of the more typical tasks encountered by people employed in these job(s) of most interest to you. . Arrange to spend a day or afternoon with a person holding a job of your choice. . Seek occupational work experience in the occupation of your choice. . If the career choice involves further schooling, investigate with your guidance counselor the schools available. . As a class project, play "What's My Line" using occupations in this area for "the mystery guest."

UNIT: Maintaining and Improving a Healthy Environment
 SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
I. Career opportunities in maintaining and improving the health of our environment. A. Careers 1. Air Pollution . chemical engineers . mechanical engineers . meteorologists . air motoring technician 2. Water Pollution . waste water disposal worker . sanitary engineer . public health engineer . water treatment operator 3. Solid Waste Pollution . sanitary engineer . public health engineer . sewage plant assistant . land-fill worker 4. Noise Pollution . sound engineer B. Occupational classification . professional . technical . entry level C. Competencies needed D. Training needed E.	I. Local people employed in occupations related to maintaining and improving the health of our environment. . <u>Fanning. Opportunities in Environmental Careers.</u> . <u>U.S. Office of Education. Career Education in the Environment - A Handbook, Chapter 2.</u>

UNIT: Maintaining and Improving a Healthy Environment
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
II. List some of the ways in which a chosen career in this area complements or fails to complement life goals. A. List the ways in which a chosen career benefits society. B. List the ways in which a chosen career might benefit the student. C.	II. Participate in a class debate of life goals. . Prepare a short paper concerning the ways in which a chosen career complements or fails to complement life goals. . As a class project, prepare a hypothetical radio program. Each student would select and bring from home a record of his choice. He would then prepare a brief "commercial" on the job of his choice. Then he would act as disc jockey as he played a record and then gave his job brief as the "commercial."
III.	III.

UNIT: Maintaining and Improving a Healthy Environment
SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
II. Career goals A. Benefits to society B. Benefits to the individual C. III.	II. Fanning. <u>Opportunities in Environmental Careers</u>, Chapter 12. III.

References

Exploring Career Opportunities

BOOKS Fanning, Odom. <u>Opportunities in Environmental Careers</u>. New York: Universal Publishing and Distributing Company, 1971. U.S. Department of Health, Education and Welfare. <u>Exploring Occupations in the Natural Resources, A Resource Guide for Grades 7-8-9</u>. Washington, D.C.: U.S. Government Printing Office, 1973.	FILMS and FILM STRIPS
BULLETINS	TRANSPARENCIES

MAINTAINING OR IMPROVING THE BEAUTY OF OUR ENVIRONMENT

UNIT: Maintaining or Improving the Beauty of Our Environment

SUB-UNIT: Planning a Community Beautification Program

OBJECTIVE(S): I. The student will be able to analyze a given environment in terms of its beauty and make recommendations for improvement if needed.

II.

UNIT: Maintaining and Improving the Beauty of Our Environment
SUB-UNIT: Planning a Community Beautification Program

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: A. Evaluate a given environment according to its functional and esthetic qualities. 1. Analyze a given landscape, structure, or product in terms of art and design principles. a. List at least six principles of design. 1. List some of the psychological effects of color. 2. b. Use a color wheel to select appropriate colors for a given creation. 1. List some of the psychological effects of color. 2. c. Analyze a given landscape in terms of design principles. 1. Differentiate between a landscape which has balance and one which does not have balance. 2. Identify the focal point in a given landscape. 3. 2. Interpret a given landscape structure or product to show how the functional esthetic qualities blend. 3.	A. With the aid of the local art teacher, artist or designer, practice analyzing landscapes, structures, and products in terms of design principles. • Write an interpretation of a landscape, structure or product. share it with the class. and have an art teacher or designer critique it for you. • Observe and/or prepare demonstrations of balance, form, repetition, unity and other design principles. • Observe and/or prepare demonstrations of the use of the color wheel for selecting color combinations. • Prepare a flower arrangement using good design and color principles. • Take a field trip to interpret landscapes, structures, and products in terms of design and color principles. •

UNIT: Maintaining and Improving the Beauty of Our Environment
 SUB-UNIT: Planning a Community Beautification Program

TOPICS	RESOURCES
A. Esthetic quality determination 1. Design principles a. Form b. Balance c. Unity d. Repetition e. Focal point f. Scale g. Rhythm h. Accent i. 2. Colors a. Complementary b. Split complementary c. Harmoneous d. 3. Evaluating landscapes, structures and products. 4.	A. Local art teacher, artist, designer. . Local garden clubs or art organizations. . Pennsylvania State University. <u>Retail Flower Shop Operation and Management.</u> . Film. <u>Color.</u> . Film. <u>Art in Our World.</u> . Film. <u>Discovering Composition in Art.</u> . Film. <u>Discovering Creative Pattern.</u> . Film. <u>Discovering Form in Art.</u> . Film. <u>Discovering Harmony in Art.</u> . Film. <u>Discovering Line.</u> . Film. <u>Discovering Texture.</u>

UNIT: Maintaining and Improving the Beauty of Our Environment
SUB-UNIT: Planning a Community Beautification Program

OBJECTIVES	LEARNING ACTIVITIES
B. Plan a program to improve the esthetics of a given local environment. 1. Analyze a given residential area in terms of esthetics and make recommendations for improvement. a. Analyze a given home landscape in terms of esthetics and make recommendations for improvement. b. Analyze a given street in terms of esthetics and make recommendations for improvement. c. 2. Analyze a given industrial area in terms of esthetics and make recommendations for improvement. a. Analyze a given factory landscape in terms of esthetics and make recommendations for improvements. b. Analyze a given work station or office in terms of esthetics and make recommendations for improvements. c. 3. Analyze a typical business area or shopping center in terms of esthetics and make recommendations for improvement. a. Analyze a given store in terms of esthetics and make recommendations for improvement. b. 4.	Each student might B. Analyze and prepare a critique of the street or rural area in which he or she lives. . As a class project and with the permission of an owner, visit an industrial plant and critique it in terms of esthetics. . As a class project and with the permission of the owner, visit a store and critique it in terms of esthetics. . As a class project, tour a residential area of areas and critique it in terms of esthetics.

UNIT: Maintaining and Improving the Beauty of Our Environment
SUB-UNIT: Planning a Community Beautification Program

TOPICS	RESOURCES
B. Beautification plan for a community 1. Evaluation and recommendations a. Residential environment . homes . streets b. Industrial areas c. Business areas d.	B. Members of city or county planning council. . USDA. <u>Outdoors USA, The Yearbook of Agriculture 1967</u>, pp. 192-400. . Pennsylvania State University. <u>Landscape Design</u> . Doker. <u>Environmental Design</u>. . U.S. Government Printing Office. <u>A Guide to Natural Beauty</u>. \$.35.

UNIT: Maintaining and Improving the Beauty of Our Environment
 SUB-UNIT: Planning a Community Beautification Program

OBJECTIVES	LEARNING ACTIVITIES
C. List the local agencies involved in maintaining or improving the beauty of the local environment. 1. List several beautification projects now in progress in the local area. 2. List the major functions of the agencies involved. 3. D. Design a set of zoning laws to protect and improve the beauty of a given environment which would be acceptable by your instructor. 1. List the major issues involved in establishing beauty as a priority. 2.	C. As a class project, interview a member of the local county government or agency of the government involved in maintaining or improving the esthetics of the local environment. . Visit a beautification project sponsored by a local agency. D. Design a hypothetical set of zoning laws for a given community. . Debate the issues involved in zoning for beauty, e.g., billboard restrictions, junkyard fencing, etc. . Attend a county or city planning session which involves zoning for beautification.

UNIT: Maintaining and Improving the Beauty of Our Environment
 SUB-UNIT: Planning a Community Beautification Program

TOPICS	RESOURCES
C. Agencies involved in beautification 1. Projects 2. Functions 3. D. Zoning 1. Industrial 2. Residential 3. Business 4.	C. Local agency representatives. . Local garden club representative. . <u>USDA. A Place to Live, the Yearbook of Agriculture, 1967, pp. 367-479.</u> D. Local city or county planners. . <u>USDA. A Place to Live. the Yearbook of Agriculture, 1963, pp. 383-400.</u>

UNIT: Maintaining or Improving the Beauty of Our Environment
 SUB-UNIT: Planning a Community Beautification Program

OBJECTIVES	LEARNING ACTIVITIES
E. Design and establish a landscape for a given home in accordance with the design principles previously identified. 1. List 6 evergreen and 6 deciduous trees acceptable for use in home landscaping. 2. List 6 small evergreen and 6 small deciduous shrubs frequently used in local home landscaping. 3. List 6 ground covers frequently used in establishing local home landscapes. 4. Establish a given small tree and a given shrub according to recommended practices established by your instructor. 5. II.	E. If time permits, design and establish a home landscape. . Design and establish a corner planting. . Observe a demonstration of and/or plant a small tree(s) and a shrub(s). . Observe a demonstration of and/or use a flannel board kit to illustrate design principles in landscaping a home. II.

UNIT: Maintaining or Improving the Beauty of Our Environment
 SUB-UNIT: Planning a Community Beautification Program

TOPICS	RESOURCES
E. Home landscape design and establishment 1. Design 2. Establishment . Plant material selection . Planting 3. II.	E. Pennsylvania State University. <u>Landscape Design.</u> . Pennsylvania State University. <u>Landscape Establishment.</u> II.

References

Planning a Community Beautification Program

BOOKS Doker, Richard P. <u>Environmental Design</u>. New York: Van Nostrand, Reinhold, 1969. The Pennsylvania State University. <u>Landscape Design</u>. The Pennsylvania State University. <u>Landscape Establishment</u>. U.S. Government Printing Office. <u>A Guide to Natural Beauty</u>. \$.35. Washington, D.C.: Superintendent of Documents. USDA. <u>A Place to Live, The Yearbook of Agriculture, 1963</u>. Washington, D.C.: U.S. Government Printing Office. USDA. <u>Outdoors USA, The Yearbook of Agriculture, 1967</u>. Washington, D.C.: U.S. Government Printing Office.	FILMS and FILM STRIPS Audio-Visual Department, Division of Educational Services, University of South Carolina, Columbia, S.C. (Films) Color <u>Art in Our World</u> <u>Discovering Composition in Art</u> <u>Discovering Creative Pattern</u> <u>Discovering Form in Art</u> <u>Discovering Harmony</u> <u>Discovering Line</u> <u>Discovering Texture</u>
BULLETINS	TRANSPARENCIES

UNIT: Maintaining and Improving the Beauty of Our Environment

SUB-UNIT: Exploring Career Opportunities

OBJECTIVE(S): I. The student will be able to compare and contrast the career opportunities related to maintaining and improving the beauty of our environment.

II. List some of the ways in which a chosen career in this area complements or fails to complement life goals.

III.

UNIT: Maintaining and Improving the Beauty of Our Environment
 SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
I. Career opportunities in maintaining and improving the beauty of our environment. A. Careers . Landscape architect . Urban planner . Architect B. Occupational classification C. Competencies needed D. Training needed E. F.	I. Local people employed in city planning, landscaping, etc. . U.S. Office of Education. <u>Career Education in the Environment - A Handbook.</u> . Fanning. <u>Opportunities in Environmental Careers, Chapter 9.</u>

UNIT: Maintaining and Improving the Beauty of Our Environment
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: I. Compare and contrast the career opportunities related to maintaining and improving the beauty of our environment. A. List the major career opportunities related to the maintenance or improvement of the beauty of our environment. B. Classify the career opportunities as to occupational levels, i.e., professional, technical, service worker, etc. C. List the major competencies required for at least one career related to each of the major occupational areas, e.g., landscape design. D. List the major activities performed by a person employed in at least one occupation associated with each of the major occupational areas. E. List the educational requirements of at least one job in each of the major occupational areas. F.	I. Interview people employed in careers related to the maintenance or improvement of the beauty of our environment. . Prepare an in-depth report on at least two occupations in this area which are of special interest. . Perform and/or observe some of the more typical tasks encountered by people employed in these job(s) which are of greatest interest. . Arrange to spend an afternoon or day with a person holding a job of your choice. . Seek occupational work experience in the occupation of your choice. . If the occupation requires further schooling, investigate, with your guidance counselor, the schools available. . As a class project, prepare and play "What's My Line," using occupations in this area for "the mystery guest."

UNIT: Maintaining and Improving the Beauty of Our Environment
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
II. List some of the ways in which a chosen career in this area complements or fails to complement life goals. A. List the ways in which a chosen career benefits society. B. List the ways in which a chosen career might benefit the student. C.	II. Participate in a class debate of life goals. . Prepare a short paper concerning the ways in which a chosen career complements or fails to complement life goals. . As a class project, prepare a hypothetical radio program. Each student would select and bring from home a record of his choice. He would then prepare a brief "commercial" on the job of his choice. Then, he would act as disc jockey as he played a record and gave his job brief as the "commercial."
III.	III.

UNIT: Maintaining and Improving the Beauty of Our Environment

SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
II. Career Evaluation A. Rewards to society B. Rewards to the individual C. III.	II. Fanning. <u>Opportunities in Environmental Careers.</u> pp. 220-230. III.

References
Exploring Career Opportunities

BOOKS Fanning, Odom. <u>Opportunities in Environmental Careers</u>. New York: Universal Publishing and Distributing Company, 1971. U.S. Department of Health, Education and Welfare. <u>Exploring Occupations in the Natural Resources, A Resource Guide for grades 7-8-9</u>. Washington, D.C.: U.S. Government Printing Office, 1973. U.S. Office of Education. <u>Career Education in the Environment</u>. Washington, D.C.: U.S. Government Printing Office.	FILMS and FILM STRIPS
BULLETINS	TRANSPARENCIES

MAINTAINING OR IMPROVING OUTDOOR RECREATION

UNIT: Maintaining or Improving Outdoor Recreation

SUB-UNIT: Planning an Outdoor Recreational Program

OBJECTIVE(S): I. The student will be able to prepare an elementary plan for improving the local outdoor recreational program.

II.

UNIT: Maintaining or Improving Outdoor Recreation
SUB-UNIT: Planning an Outdoor Recreational Program

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: A. Appraise the comprehensiveness and quality of the outdoor recreational programs of a given community. 1. List evaluative criteria for assessing the comprehensiveness and quality of an ORP for a given community. 2. List the major types of outdoor recreational programs available. 3. Develop a survey designed to determine the need for recreation. a. List agencies which provide such surveys. b. Obtain and interpret the results of a survey conducted by a local agency. c.	A. Interview ORP leaders in the local community to determine ongoing programs and adequacy of such programs. . As a class project, develop a standard recreational survey for your area. Have a local ORP leader evaluate your survey. . Prepare a checklist for evaluation program such as fishing, boating, hunting, swimming, picnicking, etc. . Locate sources of information concerning ORP and file information obtained from such sources.

UNIT: Maintaining or Improving Outdoor Recreation
 SUB-UNIT: Planning an Outdoor Recreational Program

TOPICS	RESOURCES
A. Outdoor recreational program evaluation 1. Criteria for evaluation a. Who is being served b. How many are being served c. 2. Types of programs available . Parks . Games . . golf . . baseball . . Swimming . . Fishing . . Hunting . . Camping 3. Determining demand for outdoor recreational programs 4. Agencies involved 5.	A. Local ORP persons. . Recreational foresters. . Smith and Others. <u>Rural Recreation for Profit, Chapter 1.</u> . USDA. <u>A Place to Live, The Yearbook of Agriculture, 1963, pp. 299-322.</u> . Department of Interior. <u>Community Action Program for Outdoor Recreation.</u>

UNIT: Maintaining or Improving Outdoor Recreation
 SUB-UNIT: Planning an Outdoor Recreational Program

OBJECTIVES	LEARNING ACTIVITIES
B. Plan an ORP which meets the needs of a given community. 1. Select and obtain information needed for planning. a. Determine the ORP needs for a specific program in a given community. 1. Construct a survey to determine needs. 2. List the natural resources, facilities and personnel available or needed. 3. b. List local agencies which plan ORPS. c. List sources of information useful in planning ORPS. d. 2. Make recommendations for improving the comprehensiveness and quality of the ORP of a given community.	B. Draw up recommendations for improving comprehensiveness and quality of local ORP. 1. Interview local ORP leaders to determine information about local outdoor recreational programs. • As a class project, survey the ORP needs of the local community. • Visit some of the local ORPS. • Debate the adequacy of local outdoor recreational programs. • 2. Elect a classroom committee to prepare a list of recommendations for improvement. • Ask a local ORP person to submit a list of recommendations for improvement. •

UNIT: Maintaining or Improving Outdoor Recreation
SUB-UNIT: Planning an Outdoor Recreational Program

TOPICS	RESOURCES
B. Planning an outdoor recreation program 1. Surveying demand a. Family activities • Picnicking • Boating • Camping • b. Outdoor sports • Golf • Baseball • c. Wildlife activities • Hunting • Fishing • d. 2. Determining recreational areas and facilities required a. Selecting locations b. Selecting facilities and equipment c. 3. Recommendations	B. Local outdoor recreation leaders. • Smith and Others. <u>Rural Recreation for Profit.</u> • USDA. <u>Outdoors USA, The Yearbook of Agriculture, 1967</u>, pp. 6-100. Also selections from the section entitled "The Countryside." • Department of Interior. <u>Community Action Program for Outdoor Recreation.</u> •

UNIT: Maintaining or Improving Outdoor Recreation
 SUB-UNIT: Planning an Outdoor Recreational Program

OBJECTIVES	LEARNING ACTIVITIES
C. Given a topographical map of the area, prepare an elementary forest park plan (diagram) which gives the location of such areas and facilities as camp sites, picnic areas, game areas, swimming areas, nature trails, concession stands, restrooms, roads, etc. a. List the major factors to be considered in locating roads. b. List the major factors to be considered in locating the swimming area. c. List the major factors to be considered in locating the camping area. d. List the major factors to be considered in locating the picnic area. e. List the major factors to be considered in locating the games area. f.	C. As a class project, prepare an elementary forest park plan showing the location of the major areas and facilities. . Visit a local forest park and observe and/or diagram the location of the major recreational areas and facilities. . Plan a weekend camping trip to a local forest park to study recreational areas and facilities.

UNIT: Maintaining or Improving Outdoor Recreation
 SUB-UNIT: Planning an Outdoor Recreational Program

TOPICS	RESOURCES
C. Park planning 1. Locating swimming area 2. Locating camping area 3. Locating picnic areas 4. Locating game areas 5. Locating nature trail 6. Locating roads 7. Locating facilities 8.	C. Local park superintendents. . Local forest recreationalist. . Rutledge. <u>Anatomy of a Park.</u>

UNIT: Maintaining or Improving Outdoor Recreation
SUB-UNIT: Planning an Outdoor Recreational Program

OBJECTIVES	LEARNING ACTIVITIES
D. Plan and conduct an overnight camping trip. 1. Select the equipment needed 2. Select the type shelter needed 3. Select the type and amount of food needed 4. E. Plan and conduct a field day for a group of cub scouts. 1. Select appropriate games 2. Select appropriate facilities for a given game 3. List the basic rules of a given game 4. F. II.	D. Take an overnight camping trip. . Observe demonstrations of and/or set up tents. . Observe demonstrations of and/or prepare meals. E. As a class project, plan and conduct a field day for a group of cub scouts. . As a class project, hold a dry run of the major events of a typical field day program. F. II.

UNIT: Maintaining or Improving Outdoor Recreation
SUB-UNIT: Planning an Outdoor Recreational Program

TOPICS	RESOURCES
D. Planning an overnight camping trip 1. Equipment selection 2. Shelter selection 3. Food supplies 4. E. Planning a field day 1. Selecting appropriate games 2. Selecting appropriate equipment 3. Scheduling 4. Scoring 5. Providing food, water and other supplies II.	D. Merrill. <u>The Hikers and Backpackers Handbook.</u> . USDA. <u>Outdoors USA, The Yearbook of Agriculture,</u> 1967. . Boy Scouts of America. <u>Official Boy Scout</u> <u>Manual.</u> . Film. <u>Tent Flaps and Flapjacks, 25 min.</u> E. High school coach. . Donnelly and Others. <u>Active Games and Contests.</u> II.

References

Planning an Outdoor Recreational Program

BOOKS Boy Scouts of America. <u>Official Boy Scout Manual</u>. Donnelly, Joseph D., William G. Helms and Elmer D. Mitchell. <u>Active Games and Contests</u>. New York: The Ronald Press Company, 1958. Merrill, Bill. <u>The Hikers and Backpackers Handbook</u>. New York: Winchester Press, 1971. Rutledge, Albert F. <u>Anatomy of a Park</u>. New York: McGraw-Hill, 1971. U.S. Department of Agriculture. <u>Outdoors USA, The Yearbook of Agriculture, 1967</u>. Washington D.C.: U.S. Government Printing Office. U.S. Department of Interior. <u>Community Action Program for Outdoor Recreation</u>. Washington D.C.: Superintendent of Documents.	FILMS and FILM STRIPS USDA. <u>Tent Flaps and Flapjacks</u>. Film/ 25 1/2 min. Available from State Film Library.
BULLETINS	TRANSPARENCIES

UNIT: Maintaining or Improving Outdoor Recreation

SUB-UNIT: Exploring Career Opportunities

OBJECTIVE(S): I. The student will be able to compare and contrast the career opportunities related to maintaining or improving outdoor recreation.

II. The student will be able to list some of the ways in which a career in this area complements or fails to complement life goals.

III.

UNIT: Maintaining or Improving Outdoor Recreation
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
The student will be able to: - Compare and contrast the career opportunities related to maintaining and improving outdoor recreation. - List the major career opportunities related to the maintenance or improvement of outdoor recreation and the environment. - Classify the career opportunities as to occupational levels, i.e., professional, technical, etc. - List the major competencies required for at least one career related to each of the major occupational areas, e.g., park planning. - List the major activities performed by a person employed in at least one occupation associated with each of the major occupational areas. - List the educational requirements of at least one job in each of the major occupational areas. 	- Interview people employed in careers related to the maintenance or improvement of outdoor recreation. - Prepare an in-depth report of at least two occupations in outdoor recreation which are of special interest. - Perform and/or observe some of the more typical tasks encountered by people employed in the jobs which are of greatest interest to you. - Arrange to spend an afternoon or full day with a person holding a job of your choice in outdoor recreation. - Seek occupational work experience in the occupation of your choice. - If the occupation of your choice requires further schooling, investigate with the help of your guidance counselor or teacher the school's availability. - As a class project, play "What's My Line" using occupations in this area for "the mystery guest."

UNIT: Maintaining or Improving Outdoor Recreation
 SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
I. Career opportunities in maintaining and improving outdoor recreation. A. Careers . Park caretaker . Recreational farm manager . Hunting or fishing guide . Recreational forester . Park superintendent . Camp ground manager B. Occupational classification . Professional . Technical . Entry level C. Competencies needed D. Training needed E.	I. Local people employed in outdoor recreation, e.g., park superintendents, campgrounds manager, etc. . Local recreational forester. . U.S. Department of Health, Education and Welfare. <u>Exploring Occupations in the Natural Resources</u>, p. 37. . Hoover. <u>Handbook of Agricultural Occupations</u>, pp. 263-283. . Smith. <u>Rural Recreation for Profit</u>.

UNIT: Maintaining or Improving Outdoor Recreation
SUB-UNIT: Exploring Career Opportunities

OBJECTIVES	LEARNING ACTIVITIES
II. List some of the ways in which a chosen career in this area complements or fails to complement life goals. A. List the ways in which a chosen career benefits society. B. List the ways in which a chosen career might benefit the student. C. III	II. Participate in a class debate of life goals. . Prepare a short paper concerning the ways in which a chosen career complements or fails to complement life goals. . As a class project, prepare a hypothetical radio program. Each student would select and bring from home a record of his choice. He would then prepare a brief "commercial" on the job of his choice. Then, he would act as disc jockey as he played a record and gave his job brief as the "commercial." III.

UNIT: Maintaining or Improving Outdoor Recreation
 SUB-UNIT: Exploring Career Opportunities

TOPICS	RESOURCES
II. Career Benefits A. Benefits to society B. Benefits to the individual C. III.	II. Fanning. <u>Opportunities in Environmental Careers,</u> Chapter 12. III.

References
Exploring Career Opportunities

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BULLETINS	TRANSPARENCIES

APPENDIX

APPENDIX A

Table 10.2

ENVIRONMENTAL PROTECTION AND POLLUTION CONTROL

MANPOWER NEEDS AND SUPPLY BY OCCUPATIONAL CATEGORY 1968 THROUGH 1980

Occupational Category	1968				1975				1980			
	Needs	Supply	Deficit	Needs	Supply	Deficit	Needs	Supply	Deficit	Needs	Supply	Deficit
Professional*												
Sanitary Engineers	19,300	10,000	9,300	24,800	14,600	10,200	28,400	16,500	11,900			
Other Engineers ¹	6,700	3,500	3,200	8,600	5,200	3,400	9,900	5,800	4,100			
Scientists ²	21,200	11,000	10,200	27,300	16,200	11,100	31,300	18,200	13,100			
Sanitarians	23,100	12,000	11,100	29,800	17,600	12,200	34,200	19,800	14,400			
Technologist ³	34,700	18,000	16,700	44,500	26,400	18,100	51,200	29,700	21,500			
Sub-Totals	105,000	54,500	50,500	135,000	80,000	55,000	155,000	90,000	65,000			
Paraprofessional**												
Environmental Technicians ⁴	79,000	64,000	15,000	138,000	110,000	28,000	198,000	159,000	39,000			
Environmental Aides or Assistants ^{5***}	123,000	99,000	24,000	154,000	123,000	31,000	184,000	149,000	35,000			
Sub-Totals	202,000	163,000	39,000	292,000	233,000	59,000	382,000	308,000	74,000			
Totals	307,000	217,500	89,500	427,000	313,000	114,000	537,000	398,000	139,000			

*Baccalaureate or above.

**Less than baccalaureate.

***Since the table was prepared, EPA has identified an additional need for 28,000 treatment plant operators, not included above.

TABLE 10.2 CONTINUED

- 1Includes engineers engaged in activities not specifically related to health but considered to be in environmental control, e.g., public works engineers, air pollution.
- 2Scientists engaged in research or teaching with M.S., PhD., Dr.P.H., M.D. or equivalent.
- 3Includes chemists, microbiologists, hydrologists, oceanographers, biologists, nurses, physicists, mathematicians, etc., practicing their specialties.
- 4Basic preparation of 2 years post-high school or equivalent training and experience.
- 5Vocational training and/or specific on the job training and experience.

Data Sources:

American Water Works Association-Mr. H.E. Hudson, Jr.
 Federal Water Pollution Control Administration, Department of Interior.
 DHEW-PHS-Allied Health Manpower Source Book No. 21-Unpublished revision.
 National Sanitation Foundation.

Data analyzed and interpreted by: Environmental Health Service, U.S. Department of Health, Education, and Welfare, 1970. (EHS was absorbed into the Environmental Protection Agency on EPA's establishment in December 1970.)

SOURCE: Odom Fanning, Opportunities in Environmental Careers. (New York: Universal Publishing and Distributing Corporation, 1971), pp. 206-7.

APPENDIX B

Facilities, Tools and Equipment

Facilities:

Regular Ag. Ed. classroom
 Access to the regular Ag. Ed. shop
 Nature trail (outdoor laboratory or arboretum)
 Equipment storage room (most existing Ag. Ed. shops could accommodate such a storage room)
 Bus for field trips
 Boat, motor, and boat trailer (12' x 15' boat) (or access to such a boat)

General Equipment:

Access to the more commonly used visual aids equipment, i.e., movie projectors, overhead projectors, slide projectors, etc.

Microscope (or access to microscopes available from other departments in the school)

Drawing boards (10) (size 18" x 24")

T-squares (10)

Triangles (10) 10" (30° x 60°)

Triangles (10) 8" (45°)

.....

Science Laboratory Equipment (if not already available):

Science cabinet 60W x 34H x 33D

locking drawers	stainless steel sink
three tote trays	two uprights
electric cord reel	clamps and horizontal apparatus bars
plastic top with galley pump	propane gas burner and stand

Laboratory glassware

- . 2 test tubes
- . 6 250cc flasks
- . test tube rack
- . 6 250cc beakers
- . 6 droppers
- . 6 dropping bottles
-

Water Conservation Unit:

- Transit (1)
- Canoe (1)
- Life preservers (2)
- Paddles (2)

Wildlife Conservation:

- Traps (6)
- Binoculars (6)
- Small animal cages (6)

- Incubator (1)
- Bird cages (2)
-

Forestry Conservation:

- Biltmore sticks (10)
- Tree calipers (10)
- Log rules (10)
- Planting bars (10)
- Planting mattocks (10)

- Tree increment borer (1)
- Tree markers (2)
- Backpack sprayer (1)
- Flaps (1)
- Fire rakes (1)
-

Improving Outdoor Recreation:

Exhibition tent (1) size 8' x 10'
Hiking pack (1)
Compass (1)
Bedroll (1)
Canteen (1)

Camping Equipment:

Stove (gas type) (1)
Cooler (30 quart) (1)
Mics. cooking pots and pans (1 set)
Cots (2)
Lantern (1)
First aid kit (1)

Ecology:

Seine (2)
Plantons net (1)
Hip boots (1 set)

Weather:

Thermometer (1)
Barometer (1)
Anemometer (1)
Weather vane (1)

Aquarium and accessories (1)

Bird cage (1)
.....

Weather balloon (1)
Rain gauge (1)
Sling psychrometer (1)
.....

Minerals Conservation:

Exhibition case (1)
Handlenses (2)
Picks (2)
Spades (2)
.....

Soil Conservation:

Farm level (1)
Chain or 100' tape (1)
Spades (2)
Soil display tubes (6)
Soil test kit (1)
Soil sampling tube (1)
Soil auger (1)

Maintaining or Improving the Environmental Health:

Water pollution detection kit (1)
Air pollution detection kit (1)
Air and water analysis kit (1)

Maintaining or Improving the Beauty of Our Environment:

Color wheels or charts (10)
Drawing equipment (see general)
Spades (6)
Rakes (6)
.....

APPENDIX C

SELECTED LIST OF PROFESSIONAL AND TECHNICAL SOCIETIES AND ORGANIZATIONS CONCERNED WITH NATURAL RESOURCES

A list of some professional and technical societies and associations concerned with conservation and the natural resources can be a source of useful instructional information and reference data. The compendium which follows is not a complete listing; inclusion does not imply special approval; omission does not imply disapproval of an organization. Educators and students desiring information from the organizations may address inquiries to the executive secretary at the address shown.

AIR POLLUTION CONTROL ASSOCIATION, 440 Fifth Avenue, Pittsburgh, PA 15213
AMERICAN CONGRESS ON SURVEYING AND MAPPING, 733 15th Street, N.W., Washington, DC 20005
AMERICAN FISHERIES SOCIETY, 1040 Washington Building, 15th and New York Avenues, N.W., Washington, DC 20005
AMERICAN FOREST INSTITUTE, 1835 K Street, N.W., Washington, DC 20006
AMERICAN FOREST PRODUCTS INDUSTRIES, 1816 N Street, N.W., Washington, DC 20006
THE AMERICAN FORESTRY ASSOCIATION, 1319 18th Street, N.W., Washington, DC 20036
AMERICAN GEOLOGICAL INSTITUTE, 2201 M Street, N.W., Washington, DC 20037
AMERICAN GEOPHYSICAL UNION, 211 Pennsylvania Avenue, N.W., Washington, DC 20037
AMERICAN INSTITUTE OF PLANNERS, 917 15th Street, N.W., Washington, DC 20005
AMERICAN METEOROLOGICAL SOCIETY, 45 Beacon Street, Boston, MA 02108
AMERICAN PETROLEUM INSTITUTE, 1271 Avenue of the Americas, New York, NY 10020
AMERICAN PULPWOOD ASSOCIATION, 605 Third Avenue, New York, NY 10016
AMERICAN SOCIETY OF PHOTOGRAMMETRY, 644 Leesburg Pike, Falls Church, VA 22044
AMERICAN WATER RESOURCES ASSOCIATION, P.O. Box 434, Urbana, IL 61801
AMERICAN WATER WORKS ASSOCIATION, 2 Park Avenue, New York, NY 10016

ASSOCIATION OF INTERPRETIVE NATURALISTS, 1251 E. Broad Street, Columbus, OH 43205
CONSERVATION EDUCATION ASSOCIATION, Box 450, Madison, WI 53701
ECOLOGICAL SOCIETY OF AMERICA, Oak Ridge National Laboratory, Radiation Ecology Division, Oak Ridge TN 37831
ENTOMOLOGICAL SOCIETY OF AMERICA, 5603 Calvert Road, College Park, MD 20740
INCINERATOR INSTITUTE OF AMERICA, 60 East 42nd Street, Suite 1914, New York, NY 10017
INSTITUTE OF ENVIRONMENTAL SCIENCES, 34 South Main Street, Mt. Prospect, IL 60057
NATIONAL ASSOCIATION OF SANITARIANS, University of Denver, Denver, CO 80203
NATIONAL COAL ASSOCIATION, Coal Building, 1130 Seventeenth Street, N.W., Washington, DC 20036
NATIONAL PARKS AND CONSERVATION ASSOCIATION, 1701 18th Street, N.W., Washington, DC 20009
NATIONAL RECREATION AND PARK ASSOCIATION, 1700 Pennsylvania Avenue, N.W., Washington, DC 20006
NATIONAL WILDLIFE FEDERATION, 1412 16th Street, N.W., Washington, DC 20036
THE SOCIETY OF AMERICAN FORESTERS, Suite 300, 1010 16th Street, N.W., Washington, DC 20036
SOCIETY FOR RANGE MANAGEMENT, 2120 South Birch Street, Denver, CO 80222
SOIL CONSERVATION SOCIETY OF AMERICA, INC., 7515 NE Ankeny Road, Ankeny, IA 50021
SOIL SCIENCE SOCIETY OF AMERICA, 677 South Segoe Road, Madison, WI 53711
WATER POLLUTION CONTROL FEDERATION, 3900 Wisconsin Avenue, Washington, DC 20016
WILDLIFE MANAGEMENT INSTITUTE, 709 Wire Building, Washington, DC 20025
THE WILDLIFE SOCIETY, Suite S-176, 3900 Wisconsin Avenue, N.W., Washington, DC 20016

SOURCE: U.S. Office of Education, Career Education in the Natural Resources (Washington, DC: U.S. Government Printing Office, 1973). Appendix C.

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"Water for the Cities - Outlook," Circular 601A.

FILMS:

Audio-Visual Department, Division of Educational Services, University of South Carolina, Columbia, S. C. 29208 (See catalog 1972-74 - over 200 films listed under Environmental Science).

Art in Our World.

Color.

Conserving Our Mineral Resources. 11 min./\$3.50.

Conserving Our Water Resources Today. 11 min./\$2.00.

Discovering Composition in Art.

Discovering Creative Pattern.

Discovering Form in Art.

Discovering Harmony.

Discovering Line.

Discovering Texture.

How Water Helps Us. 11/min./\$3.50

The Story of Soil. 11 min./\$2.00.

Boyd Film Company. Aqua Folly. Film/color/33 min./free. 1569 Selby Avenue, St. Paul, Mn. 55104.

Bureau of Audio Visual Instruction. Population Ecology. Film/color/19 minutes/rental \$8.25. 1327 University Avenue, P. O. Box 2093, Madison, Wisconsin 53701.

California State Polytechnic College. Careers in Natural Resource Management. Filmstrip No. 180, 53 frames, color, \$7.95/ Vocational Productions, San Luis Obispo, California 93401.

Colorado Mining Association. The Greatest Good. 402 Majestic Building, 290 South 18th Street, Denver, Co. 80202. 28 min., free loan.

Contemporary Films, McGraw-Hill, 327 West 41st, New York, New York 10036.

Air Pollution: Take a Deep Breath, 54 min./rent \$40.00.

Cities of the Future, 16 mm/color/25 min./rent \$18.00

Educational Enterprise, Cities Have No Limits. Film, color, 53 minutes, rental \$24.40. NBC 30 Rockefeller Plaza, New York, N. Y. 10020.

Encyclopedia Britannica Educational Films. 44424 Oakton Street, Skokie, Ill. 60076.

Population Ecology, Film/color/13 min./\$9.00.
Problems of Conservation - Wildlife.

The Garbage Explosion, Film/C - BW/16 mm./16 min./S. C. \$200.00.

McGraw-Hill. The Ecology of Cultivated Areas, No. 613618, Film/16mm/16 min./Rent \$12.50.
Text-Film Division, 330 West 42nd St., New York, New York 10036.

Modern Talking Picture Service, Inc. The Answer is Clear. 2323 New Hyde Park, N. Y. 11040.

National Association of Conservation Districts. Environmental Film Service, P. O. Box 855,
League City, TX 77573.

The Green City. Film/16 mm/color/23 min./S. C. \$5.00.
Urban Sprawl vs Planned Growth. Film/16 mm./color/21 1/2 min./S. C. \$5.00.
Watershed Projects for Protection and Profit. No. C - 128. Film/55 frames/color slides,
\$9.00/filmstrip, \$6.50.

National Film Board of Canada. The Population Explosion. McGraw-Hill/#696789, Film-c/16mm/15
minutes/rent \$12.50.

The South Carolina State Commission of Forestry. P. O. Box 287, Columbia, S. C. 29202.

Adventures in Conservation, 14 min.

Deep Roots, 39 min.

Extra Forest Dollars, 20 min.

Forest Conservation Part III (Living Forest Series), 11 min.

From Forest to Lumber, 14 min.

How Trees Help Us, 11 min.

Leaf, 7 min.

Life in the Deciduous Forest, 19 min.

Life in the Forest, 10 min.

Marketing Pulpwood, 12 min.

Plant - Animal Communities: Ecological Succession, 13 1/2 min.

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Patterns of the Wild. 16 mm/color/26 min.
Tent Flaps and Flapjacks. 25 1/2 min.
We Share This Land. 16mm/color/14 min.

U. S. Department of HEW. Air Pollution and You. Film/46 frames/color. Washington, D. C.

TRANSPARENCIES:

Argus Communications, 3505 North Ashland Avenue, Chicago, Illinois 60657. Posters.

Eduquip, Incorporated, 1220 Adams Street, Boston Massachusetts 02124. Kits: "Air Pollution Study Program," for experiments on detection and analysis.

Urban Systems Incorporated, 1033 Massachusetts Avenue, Cambridge, Massachusetts. Game - "Ecology The Game of Man and Nature." \$10.00.

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